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Task Order W912DQ22F3062

Final Revised 100% Specifications

U.S. Army Corps of Engineers Kansas City District



**White Chemical Corporation Superfund
Site, Operable Unit 3**

Remedial Design Revision

Newark, New Jersey

April 28, 2023

**CDM
Smith**

PROJECT TABLE OF CONTENTS

DIVISION 01 - GENERAL REQUIREMENTS

01 11 00	SUMMARY OF WORK
01 30 00	ADMINISTRATIVE REQUIREMENTS
01 32 01.00 10	PROJECT SCHEDULE
01 32 36	VIDEO MONITORING AND DOCUMENTATION
01 33 00	SUBMITTAL PROCEDURES
01 33 29	SUSTAINABILITY REQUIREMENTS AND REPORTING
01 35 29	HEALTH, SAFETY, AND EMERGENCY RESPONSE PROCEDURES
01 35 45	CHEMICAL DATA QUALITY CONTROL
01 45 00.00	CONTRACTOR QUALITY CONTROL
01 45 00.15	RESIDENT MANAGEMENT SYSTEM CONTRACTOR MODE (RMS CM)
01 50 00	TEMPORARY CONSTRUCTION FACILITIES AND UTILITIES
01 57 19	TEMPORARY ENVIRONMENTAL CONTROLS
01 58 00	PROJECT IDENTIFICATION
01 58 10	INVESTING IN AMERICA SIGNAGE
01 71 23	SURVEYING
01 78 00	CLOSEOUT SUBMITTALS
01 80 00	PERFORMANCE SAMPLING AND ANALYSIS
01 85 10	WELL MAINTENANCE PROGRAM

DIVISION 02 - EXISTING CONDITIONS

02 10 00	SITE PREPARATION
02 32 13	SUBSURFACE DRILLING AND SAMPLING
02 81 00	TRANSPORTATION AND DISPOSAL OF WASTE MATERIAL

DIVISION 13 - SPECIAL CONSTRUCTION

13 30 00	AMENDMENT INJECTION SYSTEM AND OPERATION
----------	---------------------------------------------

DIVISION 32 - EXTERIOR IMPROVEMENTS

32 00 00	SITE RESTORATION
32 01 13	ASPHALTIC PAVING

DIVISION 33 - UTILITIES

33 51 39	MONITORING WELLS
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-- End of Project Table of Contents --

SECTION 01 11 00

SUMMARY OF WORK

PART 1 GENERAL

1.1 SITE DESCRIPTION

The White Chemical Corporation (WCC) Superfund site (the site) is located in Newark, Essex County, New Jersey.

The Record of Decision (ROD) for the site defines the site as the WCC property and associated properties; however, there are several hazardous waste sites located in the area surrounding the WCC property. Therefore, to better define the extent of the site for the purpose of Operable Unit (OU) 3 Remedial Design (RD), U. S. Environmental Protection Agency (EPA) has defined the horizontal extent of the site as the area within the 1,000 microgram per liter ($\mu\text{g/L}$) contour line for site contaminants. Based on the available data at the time of the ROD, the 1,000 $\mu\text{g/L}$ contour area covered the following properties:

- a. Entirety of the WCC property, which is approximately 4.4 acres and located at 660 Frelinghuysen Avenue.
- b. A large portion of the adjacent Baltic Auto Shipping property located at 646 Frelinghuysen Avenue.
- c. Potentially extended beneath the rail line located immediately east of the WCC property; however, access to the contaminants underneath the rail line corridor is impeded.

However, the definition of the treatment zones has been modified to include an area on the WCC property encompassed by the 100 $\mu\text{g/L}$ contour line for site contaminants, as defined in Paragraph 1.9.

The ROD identified chlorinated and brominated aliphatic compounds, including: 1,2-dichloroethane (1,2-DCA), trichloroethene (TCE), 1,1,2-trichloroethane (1,1,2-TCA), tetrachloroethene (PCE), 1,1,2,2-tetrachloroethane (1,1,2,2-PCA), dibromochloropropane (DBCP), and 1,2-dibromoethane (EDB) as the site contaminants.

The National Superfund database identification number for the site is NJD980755623. The site is on the EPA's National Priorities List (NPL). Funding from both potentially responsible parties and Superfund have been used to pay for response actions at the site. EPA is the lead agency, and the New Jersey Department of Environmental Protection (NJDEP) is the support agency.

1.2 SITE HISTORY

The WCC property was used for industrial purposes dating back to 1931. In September 1970, Central Service Corporation purchased the property from Union Carbide Corporation. In 1975, Central Service Corporation sold the property to Lancaster Chemical Company, a division of AZS Corporation. In 1983, WCC leased the WCC property from AZS Corporation. WCC operated until 1990, manufacturing a variety of acid chlorides, brominated organics, mineral acids, most notably hydriodic acid, and fire retardant compounds.

Several investigations and remedial action (RA) activities were conducted by the NJDEP and EPA beginning in 1989 and continuing through the present. Details of these investigations conducted from 1989 to 2012 are provided in the ROD (EPA 2012). The investigations and RA activities are summarized below in chronological order.

- a. NJDEP conducted several inspections of the site between June and September 1989 pursuant to the Resource Conservation and Recovery Act, resulting in several Notices of Violation for a variety of infractions, including improper drum management, leaking drums, open containers, and inadequate aisle space.
- b. Between May and August 1990, NJDEP removed approximately 1,000 drums from the site.
- c. On September 7, 1990, EPA conducted a preliminary assessment at the site and found numerous drums, gas cylinders, storage tanks, vats and process reactors, fiber-pack drums, glass and plastic bottles, and laboratory-type containers containing hazardous substances in deteriorating conditions and leaking their contents onto site soils. In total, 4,700 empty drums were shipped for offsite disposal, 11 fuming drums were over-packed, and 6,700 drums were staged on site for later characterization and disposal.
- d. Between September 1990 and November 1990, various orders were issued by the EPA, the U.S District Court for the District of New Jersey, and the Agency for Toxic Substances and Diseases Registry followed by removal of several thousand drums and assessment of the site between 1990 and 1991.
- e. EPA proposed the former WCC facility and associated contamination for inclusion on the NPL on May 9, 1991, and the White Chemical Corporation site was listed on September 25, 1991.

Due to the complex nature of the site, EPA organized the work for remediating the site into three phases or OUs. Details of activities conducted as part of each OU are provided in the ROD (EPA 2012).

OU1: Addresses the stabilization of the site and removal of leaking drums and other containers of chemical waste (completed in 1993)

OU2: Addresses the contaminated surface and sub-surface soils and demolition and disposal of nine onsite buildings and above-ground storage tanks (completed in 2009)

OU3: Addresses contaminated groundwater at the site. OU3, the subject of this RD, will be the final RA for the site. The following activities have been conducted for OU3.

- a. A bench-scale treatability study, remedial investigation (RI), and feasibility study (FS) for OU3 were completed in 2012 and formed the basis for selecting the final remedy (Alternative 2) of in situ bioremediation (ISB) and long-term monitoring for addressing the contaminated groundwater at the site.
- b. EPA issued the ROD to address the groundwater contamination for OU3 at the site using the selected remedy in September 2012.

- c. Between May 2014 and January 2016, a pre-design investigation (PDI) and a pilot study (including subsequent performance monitoring) were completed at the site. The objective, scope, findings, and recommendations of the PDI and pilot study are discussed in Section 1.7.
- d. EPA performed an additional groundwater sampling event in 2021 to evaluate long-term effects of the pilot study.

1.3 SITE TOPOGRAPHY

The WCC property is generally flat and graded, with a gentle easterly slope toward the rail line. The surface elevations across the WCC property range from approximately 20 feet above mean sea level (amsl) in the north, west, and central portions to approximately 12 feet amsl in the south and east. However, the current property lessee has added sporadic patches of asphalt, dense graded aggregate, and gravel across the site, which has altered the site topography.

There are no streams or surface water bodies on the site; however, a drainage ditch is located just east of the WCC property boundary and west of the rail line corridor. This drainage ditch flows in a southerly direction.

Based on a site visit performed for the design and in 2022, the 646 Frelinghuysen property had been significantly raised with fill, and there was a new drainage ditch along the western boundary of the WCC property. The WCC property also appears to have been raised unevenly in some areas between 2016 and the 2022 site visit.

1.4 SITE GEOLOGY

Two geologic features are primarily used when discussing the site's geology: overburden and bedrock. Fill material is encountered across the site, ranging in thickness from 2 to 10 feet. The fill consists mostly of silt with trace sand and gravel. The overburden consists of 20 to 60 feet of glacial deposits, which generally thicken (considerably) from the northwest to the southeast across the site. In general, the glacial deposits are comprised of red to reddish brown silt or clay near the ground surface and near the weathered bedrock surface, with red to reddish brown sand dominating in between. Sands were generally fine to medium, with coarse sand and gravelly sand reported occasionally. Based on the OU3 RI, little to no clay was found in the subsurface at MW-6. Based on the lithological data collected during the pilot study, the thickness of the silty clay, sandy clay, and clay varies from 10 feet to less than 1 foot on top of weathered bedrock.

Beneath the overburden is the weathered bedrock, which ranges in thickness from a few feet to approximately 20 feet. The weathered bedrock is composed of highly fractured Brunswick Formation, which is predominantly composed of shales and mudstones. Bedrock is encountered at approximately 30 to 60 feet below ground surface (bgs) at the site, with bedrock elevations decreasing to the northwest and southeast.

1.5 SITE HYDROGEOLOGY

The depth to water occurs at approximately 7 to 12 feet bgs (most recent groundwater measurements measured depth to water at approximately 9.12 to 14.82 feet below top of inner casing, with approximately two feet of stick

up for each well). The potentiometric surface in the overburden generally varies up to 2 to 3 feet between precipitation events. Groundwater flows laterally in the overburden to the west, south, and east from the WCC property due to a local groundwater mound (0.5 feet) in the vicinity of WCC property; however, the overall groundwater flow direction is to the east, toward Newark Bay. Synoptic water level measurements were collected during the annual groundwater sampling program and during the pre-design investigation and pilot study. Data from the most recent rounds are provided in Table 01 11 00-2.

The uppermost portion of the Brunswick Formation is weathered to a predominantly silty, clayey lithology. This veneer of weathered bedrock ranges from a thickness of a few feet to 20 feet. The Brunswick Formation aquifer acts as a leaky, multi-unit aquifer system, where gently inclined bedding partings with the greatest hydraulic openings act as discrete aquifer units, separated by thick, leaky units. Primary porosity, permeability, and storage in the bedrock are very low; flow is dominated by secondary fracture porosity. However, the amount of flow in individual fractures or fracture sets (leakage) is variable. Two major types of joint/fracture sets dominate: shallowly-dipping and steeply-dipping fractures. The groundwater gradient in the bedrock is generally to the east, toward the Newark Airport and Newark Bay. There is also a slight southeasterly component to groundwater gradients in the bedrock.

1.6 GROUNDWATER CONTAMINATION DISTRIBUTION

1.6.1 Contaminant Distribution in the Overburden Aquifer

During the OU3 RI, contaminants in the overburden aquifer were observed to have migrated radially outward to the northwest, south, and east from the WCC property to surrounding areas. The extent of the groundwater contamination at deeper intervals in the overburden was found to be greater than in the shallow overburden due to the downward vertical migration of contamination over time resulting from infiltration and the removal of contaminated soil above the water table.

During the PDI and pilot study, additional monitoring wells were installed on the WCC property. The groundwater data collected during either the OU3 RI or the PDI/pilot study were used to evaluate the distribution and levels of overburden contamination. Groundwater contamination, as detected in the shallow overburden wells screened at the water table, ranged from non-detect to less than 20 µg/L, except in MW-7S and MW-6. Notably, contaminant concentrations in MW-6 increased between the Baseline and the Round 2 post-injection sampling event during the pilot study; for example, 1,2-DCA increased from 12 µg/L in the Baseline to 200 µg/L in Round 2.

Contaminant concentrations were observed to increase significantly at depths greater than 20 feet bgs, especially at the top of the weathered bedrock. The highest groundwater concentrations detected were in MW-6D (1,2-DCA [64,000 µg/L] and TCE [4,300 µg/L]) and MW-3D (1-bromo-2-chloroethane [30,000 µg/L], EDB [2,700 µg/L] and 1,1,2-TCA [2,700 µg/L]).

The highest concentrations detected in the overburden aquifer during the Round 4 November 2021 groundwater sampling event were 8,360 µg/L of 1,2-DCA in MW-14D, 1,200 µg/L of TCE in MW-2D, 16.3 µg/L of EDB in MW-2D, and 264 µg/L of 1,1,2-TCA in MW-14D.

1.6.2 Contaminant Distribution in the Bedrock Aquifer

During the OU3 RI, observed concentrations of 1,2-DCA in bedrock ranged from 35 to 180,000 µg/L in the nine bedrock wells on the WCC and 646 Frelinghuysen property. Both the minimum and the maximum 1,2-DCA concentrations were detected in the MW-16 well cluster on the 646 Frelinghuysen property. The maximum TCE concentration was 2,800 µg/L; the maximum 1,1,2-TCA concentration was 2,500 µg/L; and the maximum EDB concentration was 1,500 µg/L. The bottom of the bedrock contamination was not fully delineated. The high contaminant concentrations detected in MW-16B2 (1,2-DCA at 180,000 µg/L) were most likely due to migration along the down-dip fractures of bedding planes.

Matrix diffusion testing was conducted as part of the OU3 RI at one location (MW-6) from 36 to 100 feet bgs. The highest levels of 1,2-DCA contamination in the rock matrix were found from 36 to 56 feet bgs. Estimated contaminant concentrations in pore water within this zone were greater than detected in groundwater from the same depth, indicating that contaminants had migrated into the bedrock matrix. This also suggests that the concentrations of 1,2-DCA concentration were likely greater than during the OU3 RI due to diffusion of contaminants into the rock matrix.

During the pilot study, contaminant concentrations were significantly decreased in the nine bedrock wells when compared to OU3 RI results from 2011. Based on the results of the post-injection Round 2 groundwater sampling event in December 2015, the highest concentrations were 12,000 µg/L for 1,2-DCA (MW-6B3), 670 µg/L for TCE (MW-6B1), 710 µg/L for 1,1,2-TCA (MW-6B1), non-detect for EDB, and 1,100 µg/L for 1-bromo-2-chloroethane (MW-3B1).

Based on the results of the Round 4 groundwater sampling event in November 2021, the highest concentrations were detected in MW-6B1 as follows: 12,100 µg/L for 1,2-DCA, 738 µg/L for TCE, 514 µg/L for 1,1,2-TCA, and 18.8 µg/L for EDB. Four wells (MW-6B4, MW-6B2, MW-1B1, and MW1-B2) all had 1,2-DCA concentrations below 1,000 µg/L, and one well (MW-3B1) was non-detect for 1,2-DCA in 2021.

1.7 PRE-DESIGN INVESTIGATION (PDI), PILOT STUDY, AND GROUNDWATER SAMPLING

The PDI was conducted between May and July 2014. The injection portion of the pilot study was conducted between July and December 2014. Pilot study performance monitoring began in March 2015 with separate sampling events performed until September 2016. The PDI investigation was conducted to update the site-wide groundwater contaminant distribution and concentrations, whereas the pilot study was conducted to evaluate the effectiveness of different amendments (sodium lactate [lactate] vs EHC®) and different injection delivery methods (hydraulic vs pneumatic) and to collect engineering parameters to develop the overall strategy for the RD.

Activities relating to the PDI and pilot study occurred as part of one field effort; therefore, the discussion of PDI activities and findings were incorporated into the pilot study. The PDI activities included installation of new overburden monitoring wells (screened at intermediate and deep depths) and performance of the baseline round of groundwater monitoring. Pilot study activities included amendment injections in the overburden and bedrock aquifers, post-injection groundwater monitoring, and bioaugmentation in the overburden aquifer. Details of the PDI and pilot study are provided in the Draft Pilot Study Report, with a summary

of the findings provided below. The PDI and the pilot study are hereafter referred to as the pilot study.

The following findings were summarized from the pilot study report for the overburden aquifer injections:

- a. Amendment distribution was generally identified to achieve a 9-foot radius of influence (ROI); however, a more heterogeneous distribution of amendments was identified for deeper intervals with tighter geology (i.e., silts and clays) compared to a more homogenous distribution for shallower intervals with sands.
- b. Varying degrees of contaminant concentration reductions were observed with reductions of up to two orders of magnitude observed for both amendments (lactate and EHC®).
- c. Hydraulic and pneumatic injection methods achieved comparable amendment delivery rates and distribution.
- d. In general, average injection flow rates of 18 gallons per minute (gpm) and 6 gpm were observed for lactate and EHC®, respectively. Injection pressures ranged generally between 100 and 200 pounds per square inch (psi) for both the hydraulic and pneumatic injection methods.
- e. Both lactate and EHC® continued to act as carbon sources based on the results of Round 2 post-injection groundwater sampling event, thereby continuing to enhance the in situ biodegradation of site contaminants. Additional groundwater sampling will need to be conducted to further evaluate the longevity of the amendments and to monitor further reductions in site contaminant concentrations.
- f. Both lactate and EHC® were identified to successfully stimulate the growth of indigenous bacteria that are capable of degrading site contaminants. QuantArray-Chlor results from MW-26D and MW-27D (treated with lactate) and from MW-23D and MW-25D (treated with EHC®) showed increases of *Dehalobacter* ssp., *Dehalococcoides* ssp.(DHC), *Dehalogenimonas* ssp., and 1,2-DCA reductase to above 104 cells per milliliter, indicating that a very active microbial community had been established.
- g. Following bioaugmentation in one well (MW-7D), the populations of DHC and tceA reductase increased by four orders of magnitude at MW-7D. Additionally, a reduction of three orders of magnitude in the concentration of site contaminants was observed at MW-7D after bioaugmentation. Overall, bioaugmentation using site groundwater was identified to be a viable approach for bioaugmentation during the RA.

The following findings were summarized from the pilot study report for the bedrock aquifer injections:

- a. Similar to the overburden aquifer results, varying degrees of contaminant concentration reductions were also observed in the bedrock aquifer with up to a two order of magnitude reduction in site contaminant concentrations.
- b. Lactate continued to act as a carbon source based on the results of the Round 2 post-injection groundwater sampling event, thereby continuing to enhance the in situ biodegradation of site contaminants.

Additional groundwater sampling will need to be conducted to further evaluate the longevity of the amendment and the overall reduction in site contaminants.

- c. Injection flow rates varied significantly for bedrock wells. The injection rates at MW-6B1, MW-6B4, and MW-3B1 were between 0.5 to 2 gpm using a gravity feed system but increased to 5.1 gpm in MW-6B4 under 20 psi of injection pressure. The injection rates at MW-1B1 and MW-6B3 were approximately 0.5 and 0.3 gpm under 20 psi of injection pressure. Injections at MW-1B2, MW-6B2, MW-16B1, and MW-16B2 did not reach their target injection volumes upon completion of the pilot study. These wells did not readily accept the amendment solution even under an injection pressure of 20 psi.
- d. The high concentration lactate injected into the bedrock aquifer successfully stimulated the growth of indigenous bacteria for biodegradation of site contaminants in the majority of bedrock wells. QuantArray-Chlor data from MW-1B2, MW-6B1, MW-6B2, and to a lesser degree from MW-6B4, indicated high microbial populations.

After the pilot study report was published, EPA collected groundwater samples from a select number of wells in 2021 to update the understanding of the site contamination conditions.. Sample results from the select number of monitoring wells show significant decreases of contaminant concentrations from previous sampling events. This data demonstrates that EHC supports long-term contaminant degradation, while lactate may not provide support for continued contaminant degradation.

1.8 PROJECT OBJECTIVES

The September 2012 OU3 ROD final remedy for the site outlined the Remedial Action Objectives (RAOs), which address the human health risks and environmental concerns (EPA 2012). Based on the site-specific human health risk assessment results, site-related contaminants are chlorinated and brominated aliphatic compounds, including 1,2-DCA, TCE, 1,1,2-TCA, PCE, 1,1,2,2-PCA, DBCP, and EDB. These contaminants are volatile organic compounds (VOCs) and pose risks to human health through inhalation, ingestion, and dermal contact. The following RAOs address the human health risks and environmental concerns posed by VOC-contaminated groundwater at the site:

- a. Protect human health by preventing exposure via drinking and showering to contaminated groundwater concentrations above remediation goals (RGs)
- b. Restore the groundwater in both the shallow and deep overburden aquifers to drinking water standards by reducing site contaminant concentrations to RGs to the extent practicable
- c. Decrease contaminant mass in the bedrock aquifer to the extent practicable

To achieve the above RAOs, RGs were developed for site contaminants in groundwater that, when achieved, will pose no unacceptable risk to human health and the environment. The lower of either the EPA federal maximum contaminant levels (MCLs) or NJDEP Ground Water Quality Standards (GWQS) was selected as the RGs where an applicable or relevant and appropriate requirement waiver is not being sought in the overburden aquifer. For the bedrock aquifer, the RGs are for developing use restrictions and other

actions to prevent exposure and for assessing mitigation of the aqueous plume but not for achieving restoration of the groundwater. RGs for site contaminants, including chlorinated and brominated VOCs, are provided in SECTION 01 35 45 CHEMICAL DATA QUALITY CONTROL.

Active treatment areas for the site have been defined as follows:

- a. Overburden Aquifers: Areas with site contaminant concentrations exceeding the RGs require remediation. An active treatment area with site contaminant concentration exceeding 100 µg/L has been developed for the overburden aquifer on WCC property. An active treatment area with site contaminant concentration exceeding 1,000 µg/L has been developed for the overburden aquifer on 646 Frelinghuysen. This area approximates the delineation of contaminated groundwater currently known to be attributable to historical actions associated with the former WCC facility and excludes the portions of the groundwater where comingling plumes are believed to be occurring due to other known sources. The currently defined active treatment area is located on the WCC property, which currently has no buildings and is accessible for remediation. The final delineation of the treatment area will be re-evaluated based on groundwater screening results during the RA.
- b. Bedrock Aquifer: Remediation would also be carried out at known site-related, contaminated areas in the bedrock aquifer. Areas with known contamination in the bedrock zone surrounding well clusters MW-1, MW-6, and MW-16 would be treated to reduce the contaminant mass in the bedrock aquifer to the extent practical. Additionally, another bedrock well cluster may be identified for injections based on pre-injection sampling. Bedrock areas for remediation will be re-evaluated after the new bedrock wells are installed during the RA.

The major components of the OU3 selected remedy include:

- a. In situ bioremediation of the groundwater in the shallow and deep overburden aquifers by reducing site contaminant concentrations to federal MCLs and NJ GWQS to the extent practical
- b. Treatment of the bedrock aquifer in an effort to decrease contaminant mass to the extent practical
- c. The establishment of a Classification Exception Area (CEA), which is an institutional control (IC), to minimize the potential for exposure to contaminated groundwater
- d. Implementation of a long-term sampling and analysis program to monitor the contamination at the site to assess groundwater migration, and to establish whether contaminants are meeting the federal MCLs or NJ GWQS, whichever is lower.

1.9 REMEDIAL ACTION SCOPE

Based on the results of the pilot study performed at the site, the RA described in this RD will consist of implementing amendment injections. To provide flexibility during the RA, the RA scope will be further divided and managed as follows:

- a. For the overburden aquifer:
 - (1) ISB of contaminated groundwater within the entire lateral area of

the WCC property (defined as the lateral area within the 100 µg/L concentration contour for 1,2-DCA) and within the lateral area of the 1,000 µg/L concentration contour for 1,2-DCA on the 646 Frelinghuysen property. The vertical treatment zone on both properties is defined as the interval from the shallowest depth containing 100 µg/L or greater of 1,2-DCA to the top of weathered bedrock.

- (2) Areas of the groundwater plume with site contaminant concentrations greater than the RGs, but less than 100 µg/L, on the WCC and 646 Frelinghuysen properties will be monitored to determine if natural attenuation will further reduce the concentrations to the RGs as part of the CEA.

- b. For the bedrock: Installation of four new wells in the bedrock for monitoring and/or injection and ISB of contaminated groundwater at seven existing and potentially four new bedrock wells.

1.10 WORK COVERED BY CONTRACT DOCUMENTS

Complete all work covered by the Contract Documents for overburden and bedrock injections. The Contract Documents (specifications and drawings) were prepared using a combination of performance and prescriptive design. Develop the means and methods to complete the work; a list of the definable features of work (DFWs) is listed below.

The ISB injection-related design quantities (e.g., area, volume, amendment quantities, injection volume, duration) are based on the groundwater samples results from the RI, pilot study, and pilot study performance monitoring. The quantities will be updated after the pre-RA groundwater screening program.

The listing of work items and work sequence presented herein may not include all specific items. The exact description of work must be covered by the full Contract Documents.

Work for the site overall includes the following definable features of work:

- a. Establishing the trailer compound, including the utility connections and other temporary facilities
- b. Placement of dense graded aggregate on the driveway entering the WCC property
- c. Establishing site security, a temporary decontamination area, a chemical staging area, and a connection to the City of Newark water hydrant.
- d. Site clearing and removal of construction debris
- e. Performance of a utility survey at both the WCC property and the 646 Frelinghuysen Avenue property
- f. Performance of a topographic survey at the WCC and 646 Frelinghuysen properties
- f. Performance of well condition assessment and repair or abandon existing monitoring wells as directed by the Contracting Officer

- g. Disposal of wastes generated during the remedial action according to federal and state laws and requirements
- h. Performance of site restoration

Work specifically for the overburden aquifer includes the following definable features of work:

- a. Performance of direct push technology (DPT) groundwater screening
- b. Installation of overburden monitoring wells and well development
- c. Surveying of groundwater screening locations, new monitoring wells, and existing flush mount monitoring wells
- d. Performance of a baseline groundwater sampling event of the overburden monitoring wells
- e. Prepare the amendment injection work plan and obtain Contracting Officer approval
- f. Performance of an initial round of amendment injections in the overburden aquifer to enhance anaerobic bioremediation
- g. Performance of Round 1, 2, and 3 performance monitoring events following completion of the initial round of injections, respectively
- h. Performance of a second round of amendment injections in the overburden, as directed by the Contracting Officer, based on sample results from the Round 2 and Round 3 performance monitoring events
- i. If a second injection event is conducted, two additional rounds of groundwater sampling (Round 4 and Round 5) will be completed after the second injection event. If a second injection event is not conducted, only one round (Round 4) will be conducted.

Work specifically for the bedrock aquifer includes the following definable features of work. Bedrock activities must be conducted concurrent with overburden activities as possible so that the overall duration requiring access is not extended.

- a. Advance four bedrock boreholes at the WCC property
- b. Install a blank DNAPL FLUTE™ liner to prevent cross-contamination between fractures within the individual boreholes and help identify possible DNAPL zones
- c. Perform downhole geophysics and packer testing in each borehole
- d. Determine screen intervals for both the shallow and deep bedrock wells associated with each borehole
- f. Install the shallow and deep bedrock wells and perform well development
- g. Performance of a baseline groundwater sampling event of the bedrock monitoring wells
- h. Injections into up to 11 bedrock wells in accordance with the approved

amendment injection work plan as directed by the Contracting Officer

- i. Collection of bedrock well groundwater samples during performance monitoring events following the bedrock injections

1.10.1 Permits and Approvals

Obtain the necessary permits and approvals from applicable federal, state, and local regulatory agencies to execute the project.

Access to the site for the construction of the staging area and field operations will be obtained by the Government.

Below is a summary of permit equivalencies and approvals that have been identified as being required for the work at the site.

Table 01 11 00 - 1 Permit Equivalencies and Approvals		
Authority	Permits/Approval	Responsibility
NJDEP Division of Water Quality	New Jersey State Pollution Discharge Elimination System Discharge to Ground Water permit equivalency	Contractor
NJDEP Division of Water Supply and Geoscience	Monitoring well permits	Contractor
	Monitoring well sealing and abandonment	Contractor
Local municipal government - City of Newark	Local construction permits for construction activities	Contractor

1.10.2 Submittals

Provide all submittals identified in the specifications and summarized in the submittal register in accordance with SECTION 01 33 00 - SUBMITTAL PROCEDURES.

1.10.3 Performance

Provide all utilities, materials, equipment, labor, and facilities required to perform the work specified herein in accordance with the Contract Drawings and Specifications.

1.10.4 Health and Safety

Comply with health and safety requirements as specified in SECTION 01 35 29 - HEALTH, SAFETY, AND EMERGENCY RESPONSE PROCEDURES, including air monitoring in the work zone and site security.

1.10.5 Temporary Facilities

Establish the temporary facilities as shown on the Contract Drawings and

in accordance with SECTION 01 50 00 - TEMPORARY CONSTRUCTION FACILITIES AND UTILITIES.

1.10.6 Site Preparation

Perform site preparation including surveying, installation of the staging area and decontamination pads, gravel placement, and clearing, as shown on the Contract Drawings and in accordance with SECTION 02 10 00 - SITE PREPARATION.

1.10.7 Groundwater Screening

Perform groundwater screening sampling in accordance with SECTION 02 32 13 - SUBSURFACE DRILLING AND SAMPLING. Perform all sample analysis in accordance with SECTION 01 35 45 - CHEMICAL DATA QUALITY CONTROL.

1.10.8 Monitoring Well Assessment, Repair, and Installation

Conduct a well condition assessment and repair monitoring wells as necessary and install new overburden and bedrock monitoring wells in accordance with SECTION 33 51 39 - MONITORING WELLS, including performing the necessary investigation activities to collect data needed to inform monitoring well installation.

1.10.9 Performance Sampling and Analysis

Perform performance sampling activities in accordance with SECTION 01 80 00 - PERFORMANCE SAMPLING AND ANALYSIS, including baseline and post-injection groundwater monitoring sampling events. Perform all sample analysis in accordance with SECTION 01 35 45 - CHEMICAL DATA QUALITY CONTROL.

1.10.10 Well Maintenance

Perform well maintenance activities in accordance with SECTION 01 85 10 - WELL MAINTENANCE PROGRAM.

1.10.11 Amendment Injection

Perform amendment injection in the overburden and bedrock in accordance with SECTION 13 30 00 - AMENDMENT INJECTION SYSTEM AND OPERATION and the Contractor's approved plans.

1.10.12 Waste Characterization, Handling, and Disposal

Perform waste characterization in accordance with SECTION 01 35 45 - CHEMICAL DATA QUALITY CONTROL and SECTION 02 81 00 - TRANSPORTATION AND DISPOSAL OF WASTE MATERIAL.

1.10.13 Site Restoration

Perform site restoration as shown on the Contract Drawings and in accordance with SECTION 32 00 00 - SITE RESTORATION.

1.11 GREEN REMEDIATION

Perform green remediation in accordance with federal requirements and SECTION 01 33 29 - SUSTAINABILITY REQUIREMENTS AND REPORTING.

White Chemical Corporation Superfund Site, OU3
Final 100% Remedial Design

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

-- End of Section --

Table 01 11 00-2
Monitoring Well Construction and Groundwater Elevation
White Chemical Corporation Superfund Site OU3

	Well Construction Information						
	Location	Well Diameter/ Materials	Top of Inner Casing Elev. (feet amsl)	Easting (X)	Northing (Y)	Well Screen Interval (feet bgs)	Well Depth (feet bTIC)
Bedrock	MW-181	2-inch SS	16.40	576399.103	678669.9205	73-83	86.21
	MW-182	2-inch SS	16.39	576399.103	678669.9205	95-100	104.5
	MW-3B1	4-inch SS	18.32	576571.2673	679048.604	52-62	63.76
	MW-6B1	2-inch SS	20.08	576265.4819	679151.7092	42-52	53.8
	MW-6B2	2-inch SS	20.08	576265.4819	679151.7092	85-95	96
	MW-6B3	2-inch SS	19.95	576278.7004	679172.777	114-124	121.05
	MW-6B4	2-inch SS	19.99	576278.7004	679172.777	155-165	168.5
	MW-16B1	2-inch PVC	18.10	576175.4691	679479.2831	43-53	53.15
Deep Overburden	MW-16B2	2-inch PVC	18.21	576175.4691	679479.2831	77-87	87.35
	MW-1D	2-inch SS	15.55	576424.781	678676.5222	40-45	48.32
	MW-2D	4-inch SS	18.26	576496.6264	678864.3806	33-43	45.28
	MW-3D	2-inch SS	18.39	576579.2285	679066.5576	36-41	44.28
	MW-5D	2-inch SS	17.14	576351.4749	679389.7668	24-29	31.14
	MW-6D	4-inch SS	20.03	576262.479	679181.5929	24-34	35.8
	MW-7D	2-inch SS	18.47	576349.4087	678941.6514	24-29	32.12
	MW-14D	4-inch PVC	19.00	576044.2056	679257.0653	26-36	35.42
	MW-16D	4-inch SS	18.36	576169.01	679473.45	24-34	28.74
	MW-22D	2-inch PVC	19.05	576344.1258	679188.9907	28.5-38.5	38.61
	MW-23D	2-inch PVC	18.99	576369.5645	679167.6945	34-44	45.81
	MW-24D	2-inch PVC	21.97	576288.3871	679077.5138	25.5-35.5	36.42
	MW-25D	2-inch PVC	21.37	576325.2359	679067.3191	34-44	46.2
	MW-26D	2-inch PVC	19.86	576299.6843	678915.4236	24.5-34.5	35.78
	MW-27D	2-inch PVC	19.75	576425.1951	679002.1369	34-44	43.7
	MW-28D	2-inch PVC	20.54	576395.7008	679034.3224	34-44	45.4
Intermediate Overburden	MW-23I	2-inch PVC	19.27	576363.5893	679158.2427	22-32	27.95
	MW-25I	2-inch PVC	21.36	576319.9376	679056.3407	22-32	33
	MW-26I	2-inch PVC	19.52	576307.71	678922.7321	15-25	25.36
	MW-27I	2-inch PVC	19.81	576434.2889	679017.8575	17.2-27.2	27.8
	MW-28I	2-inch PVC	20.43	576387.0546	679024.3626	16.7-26.7	28.4
Shallow Overburden	MW-1S	2-inch SS	17.08	576419.5529	678660.8667	7-17	20.09
	MW-2	2-inch SS	18.37	576512.4184	678842.5108	7-17	19.25
	MW-3S	2-inch SS	18.22	576590.2903	679062.0238	7-17	20.52
	MW-4	2-inch SS	19.22	576423.7993	679232.1869	8-18	21.2
	MW-5S	2-inch SS	17.28	576340.7272	679394.2272	7-17	17.9
	MW-6	2-inch PVC	19.57	576257.7162	679167.8976	7-17	17.3
	MW-7S	2-inch SS	19.03	576341.0676	678947.8665	7-17	18.97
	MW-14S	4-inch PVC	18.95	576042.7754	679261.6208	10-20	18.72
	MW-22S	2-inch PVC	19.36	576336.2589	679178.0484	17-27	27.51
	MW-24S	2-inch PVC	21.67	576284.1925	679066.3724	15-25	26.74

Notes:
ft amsl - feet above mean sea level
ft bgs - feet below ground surface
ft bTIC - feet below top of inner casing
PVC - polyvinyl chloride
SS - stainless steel

Ground finishing for each well to be determined during well condition assessment.

Top of inner casing elevations are based on survey completed before the wells were modified resulting from a change in site conditions. All monitoring wells require resurveying.

Generally, shallow wells are screened at the water table, deep wells are screened on top of the weathered bedrock, and intermediate wells are screened in between the two. The three depths (especially intermediate and deep) vary due to variations in contaminant distribution and the depth to the weathered bedrock.

Table 01 11 00-2
Monitoring Well Construction and Groundwater Elevation
White Chemical Corporation Superfund Site OU3

		Water levels measured in feet below TIC							
		Remedial Investigation Data				Pilot Study Data			
	Location	Depth to Water - September 2009 (feet bTIC)	Depth to Water - June 2010 (feet bTIC)	Depth to Water - June 2011 (feet bTIC)	Depth to Water - October 2011 (feet bTIC)	Depth to Water - July 2014 (feet bTIC)	Depth to Water - April 2015 (feet bTIC)	Depth to Water - December 2015 (feet bTIC)	Depth to Water - November 2021 (feet bTIC)
Bedrock	MW-181	NA	9.46	8.8	8.74	9.32	9.69	10.24	8.6
	MW-182	NA	9.61	8.9	8.91	9.5	19.03	12.18	9.2
	MW-3B1	NA	11.42	10.7	10.64	11.12	12.66	12.76	11.3
	MW-6B1	NA	12.92	12.25	12.21	12.6	12.91	13.44	14.4
	MW-6B2	NA	13.05	12.39	12.36	12.77	15.95	14.74	12.5
	MW-6B3	NA	NA	12.5	12.51	12.94	17.68	17.86	-
	MW-6B4	NA	NA	12.4	12.4	13.02	13.2	13.74	14.5
	MW-16B1	NA	11.09	15.05	12.56	12.34	12.65	11.59	-
Deep Overburden	MW-16B2	NA	11.21	21.35	14.42	15.37	21.55	11.9	-
	MW-1D	8.76	8.39	7.55	7.45	8.22	8.4	9.12	-
	MW-2D	NA	10.85	9.86	9.77	10.43	10.6	11.54	9.55
	MW-3D	10.69	10.3	9.55	9.42	9.92	10.02	11.11	10.8
	MW-5D	9.5	9.2	8.42	8.24	8.71	8.93	9.89	-
	MW-6D	NA	12.8	12.2	12.17	12.45	12.7	13.14	13.5
	MW-7D	10.66	10.29	9.35	9.32	9.82	10.05	11.14	-
	MW-14D	NA	11.32	10.21	10.98	11.65	10.91	11.87	10.98
	MW-16D	NA	10.68	10.1	10.06	16.28	10.51	11.26	-
	MW-22D	-	-	-	-	11.97	11.85	12.38	-
	MW-23D	-	-	-	-	11.85	11.96	12.57	13.95
	MW-24D	-	-	-	-	14.52	13.74	14.82	12.4
	MW-25D	-	-	-	-	13.65	13.93	14.64	13.1
	MW-26D	-	-	-	-	12.64	12.3	13.01	-
	MW-27D	-	-	-	-	12.52	12.72	13.25	12.61
	MW-28D	-	-	-	-	12.45	12.12	13.38	-
Intermediate Overburden	MW-23I	-	-	-	-	10.61	10.73	11.82	-
	MW-25I	-	-	-	-	12.75	12.85	13.96	12.25
	MW-26I	-	-	-	-	10.94	11.14	12.23	-
	MW-27I	-	-	-	-	11.12	11.28	12.4	-
	MW-28I	-	-	-	-	11.79	11.96	13.06	11.59
Shallow Overburden	MW-1S	9.91	9.4	8.5	8.36	9.2	9.36	10.23	-
	MW-2	10.71	10.16	9.3	9.16	9.79	9.92	11.12	8.85
	MW-3S	10.4	9.89	9.1	8.97	9.45	9.57	10.69	10.32
	MW-4	11.29	10.92	10.12	10	10.45	10.63	11.73	-
	MW-5S	9.5	9.29	8.5	8.29	8.75	8.97	9.97	-
	MW-6	11.51	11.38	10.5	10.47	10.82	11.11	12.18	13.1
	MW-7S	10.12	10.76	9.83	9.81	10.3	10.52	11.59	8
	MW-14S	NA	11.02	10.2	10.12	10.57	10.84	11.68	10.72
	MW-22S	-	-	-	-	10.7	10.83	11.93	-
	MW-24S	-	-	-	-	13.03	13.17	14.25	12.35

Notes:

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ft bgs - feet below ground surface

ft bTIC - feet below top of inner casing

PVC - polyvinyl chloride

SS - stainless steel

Ground finishing for each well to be determined during well condition assessment.

Top of inner casing elevations are based on survey completed before the wells were modified resulting from a change in site conditions. All monitoring wells require resurveying.

Generally, shallow wells are screened at the water table, deep wells are screened on top of the weathered bedrock, and intermediate wells are screened in between the two. The three depths (especially intermediate and deep) vary due to variations in contaminant distribution and the depth to the weathered bedrock.

Table 01 11 00-2
Monitoring Well Construction and Groundwater Elevation
White Chemical Corporation Superfund Site OU3

		Water levels measured in feet amsl							
		Remedial Investigation Data				Pilot Study Data			
	Location	Water Level - September 2009 (feet amsl)	Water Level - June 2010 (feet amsl)	Water Level - June 2011 (feet amsl)	Water Level - October 2011 (feet amsl)	Water Level - July 2014 (feet amsl)	Water Level - April 2015 (feet amsl)	Water Level - December 2015 (feet amsl)	Water Level - November 2021 (feet amsl)
Bedrock	MW-181	NA	6.94	7.60	7.66	7.08	6.71	6.16	7.80
	MW-182	NA	6.78	7.49	7.48	6.89	-2.64	4.21	7.19
	MW-3B1	NA	6.90	7.62	7.68	7.20	5.66	5.56	7.02
	MW-6B1	NA	7.16	7.83	7.87	7.48	7.17	6.64	5.68
	MW-6B2	NA	7.03	7.69	7.72	7.31	4.13	5.34	7.58
	MW-6B3	NA	NA	7.45	7.44	7.01	2.27	2.09	Not measured.
	MW-6B4	NA	NA	7.59	7.59	6.97	6.79	6.25	5.49
	MW-16B1	NA	7.01	3.05	5.54	5.76	5.45	6.51	Not measured.
Deep Overburden	MW-16B2	NA	7.00	-3.14	3.79	2.84	-3.34	6.31	Not measured.
	MW-1D	6.79	7.16	8.00	8.10	7.33	7.15	6.43	Not measured.
	MW-2D	NA	7.41	8.40	8.49	7.83	7.66	6.72	8.71
	MW-3D	7.70	8.09	8.84	8.97	8.47	8.37	7.28	7.59
	MW-5D	7.64	7.94	8.72	8.90	8.43	8.21	7.25	Not measured.
	MW-6D	NA	7.23	7.83	7.86	7.58	7.33	6.89	6.53
	MW-7D	7.81	8.18	9.12	9.15	8.65	8.42	7.33	Not measured.
	MW-14D	NA	7.68	8.79	8.02	7.35	8.09	7.13	8.02
	MW-16D	NA	7.68	8.26	8.30	2.08	7.85	7.10	Not measured.
	MW-22D	-	-	-	-	7.08	7.20	6.67	Not measured.
	MW-23D	-	-	-	-	7.14	7.03	6.42	5.04
	MW-24D	-	-	-	-	7.45	8.23	7.15	9.57
	MW-25D	-	-	-	-	7.72	7.44	6.73	8.27
	MW-26D	-	-	-	-	7.22	7.56	6.85	Not measured.
	MW-27D	-	-	-	-	7.23	7.03	6.50	7.14
	MW-28D	-	-	-	-	8.09	8.42	7.16	Not measured.
Intermediate Overburden	MW-23I	-	-	-	-	8.66	8.54	7.45	Not measured.
	MW-25I	-	-	-	-	8.61	8.51	7.40	9.11
	MW-26I	-	-	-	-	8.58	8.38	7.29	Not measured.
	MW-27I	-	-	-	-	8.69	8.53	7.41	Not measured.
	MW-28I	-	-	-	-	8.64	8.47	7.37	8.84
Shallow Overburden	MW-1S	7.17	7.68	8.58	8.72	7.88	7.72	6.85	Not measured.
	MW-2	7.66	8.21	9.07	9.21	8.58	8.45	7.25	9.52
	MW-3S	7.82	8.33	9.12	9.25	8.77	8.65	7.53	7.90
	MW-4	7.93	8.30	9.10	9.22	8.77	8.59	7.49	Not measured.
	MW-5S	7.78	7.99	8.78	8.99	8.53	8.31	7.31	Not measured.
	MW-6	8.06	8.19	9.07	9.10	8.75	8.46	7.39	6.47
	MW-7S	8.91	8.27	9.20	9.22	8.73	8.51	7.44	11.03
	MW-14S	NA	7.93	8.75	8.83	8.38	8.11	7.27	8.23
	MW-22S	-	-	-	-	8.66	8.53	7.43	Not measured.
	MW-24S	-	-	-	-	8.64	8.50	7.42	9.32

Notes:

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Top of inner casing elevations are based on survey completed before the wells were modified resulting from a change in site conditions. All monitoring wells require resurveying.

Generally, shallow wells are screened at the water table, deep wells are screened on top of the weathered bedrock, and intermediate wells are screened in between the two. The three depths (especially intermediate and deep) vary due to variations in contaminant distribution and the depth to the weathered bedrock.

SECTION 01 30 00

ADMINISTRATIVE REQUIREMENTS

PART 1 GENERAL

1.1 SCOPE OF WORK

Provide all services, including labor, equipment, materials, and incidentals, required to ensure site safety, site security, site communication, project management, conduct conferences and progress meetings, collect photographic documentation, recordkeeping, and individual additional task performance. These services must include the provision of qualified personnel, to be accepted by the Government, and all equipment necessary to perform such tasks.

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals with an "FIO" designation are for information only. Submit the following to the Contracting Officer in accordance with SECTION 01 33 00 - SUBMITTAL PROCEDURES.

SD-01 Preconstruction Submittals

Project Organizational Chart; G

Submit a project organizational chart including all personnel to be employed on the project and their project roles.

Project Manager Name and Experience; G

Within 14 calendar days following the task order award, digitally submit in writing to the Contracting Officer the name and experience of the project manager.

Data Retrieval Recordkeeping System; G

Submit a description of the proposed data retrieval recordkeeping system.

View Location Map

Prior to or with the first digital photograph submittals, submit a photograph view location map for approval in accordance with Paragraph 3.4.1.

SD-03 Product Data

Conference Meeting Minutes; G

Record the minutes of the meetings including significant proceedings and decisions arising from the four conferences (pre-construction conference, pre-work conference, pre-construction quality control conference, and pre-construction safety conference). Within five (5) calendar days after each meeting, furnish an electronic copy of the minutes to the

Contracting Officer.

Project Progress Meeting Minutes; G

Record the minutes of all Project Progress Meetings, including any significant proceedings and decisions. Within two (2) calendar days after each meeting, furnish an electronic copy of the minutes to the Contracting Officer.

SD-11 Closeout Submittals

Pre-Construction and Post-Construction Project Photographs; FIO

Submit Pre-Construction and Post-Construction Project Photographs as specified in Paragraph 3.4 herein.

Progress Project Photographs; FIO

Submit Progress Project Photographs as specified in Paragraph 3.4 herein.

1.3 MINIMUM INSURANCE REQUIREMENTS

The minimum insurance coverage required by FAR 28.307-2 Liability must be provided during the entire period of performance under this contract. Other insurance coverage must be provided as required by State law.

1.4 PRE-CONSTRUCTION CONFERENCE

Within 30 calendar days after the task order award and prior to commencing any work at the site, coordinate with the Contracting Officer a time and place to meet for the Preconstruction Conference. The purpose of this conference is to discuss and develop a mutual understanding of the administrative requirements of the Contract including but not limited to: the contract clauses (Division 0), project schedule and schedule requirements, daily reporting, invoicing, value engineering, safety, schedule requirements, quality control, schedule of prices or earned value report, shop drawings, submittals, cybersecurity, prosecution of the work, government acceptance, final inspections and contract close-out. Present and discuss their basic approach to scheduling the construction work and any required phasing.

Contractor attendees must include the Project Manager, Superintendent, and Quality Control Manager.

1.5 PRE-WORK CONFERENCE

Within 21 calendar days after the Pre-Construction Conference and prior to mobilization, a Pre-Work Conference must be held between the Contractor and the Government. Contractor attendees must include the Contractor's Project Manager, Superintendent, Quality Control Manager and personnel, Site Safety and Health Officer (SSHO), and any major subcontractor's superintendents. The purpose of this conference is to review submittals, safety, payrolls and labor relations, environmental protection, project schedules and payment, procurement of materials, and work plans.

Unless otherwise specified, submit for review an electronic copy of the following at least 14 calendar days prior to the Pre-Work Conference:

- a. Project Organizational Chart, Project Manager Name and Experience, and Data Retrieval Record Keeping System.
- b. Project Scheduler Qualification and Preliminary and Initial Project Schedules, in accordance with SECTION 01 32 01.00 10 - PROJECT SCHEDULE.
- c. Submittal Register, in accordance with SECTION 01 33 00 - SUBMITTAL PROCEDURES.
- e. Accident Prevention Plan/Site Safety and Health Plan (APP/SSHP), in accordance with SECTION 01 35 29 - HEALTH, SAFETY, AND EMERGENCY RESPONSE PROCEDURES.
- f. Environmental Protection Plan, in accordance with SECTION 01 57 19 - TEMPORARY ENVIRONMENTAL CONTROLS.
- h. Uniform Federal Policy Quality Assurance Project Plan (UFP-QAPP), in accordance with SECTION 01 35 45 - CHEMICAL DATA QUALITY CONTROL.
- i. Contractor Quality Control (CQC) Plan, in accordance with SECTION 01 45 00.00 - CONTRACTOR QUALITY CONTROL.
- j. Temporary Site Facility Layout Plan, in accordance with SECTION 01 50 00 - TEMPORARY CONSTRUCTION FACILITIES AND UTILITIES.
- k. Site Preparation Plan, in accordance with SECTION 02 10 00 - SITE PREPARATION.
- l. Amendment Injection Work Plan, in accordance with SECTION 13 30 00 - AMENDMENT INJECTION SYSTEM AND OPERATION
- m. Waste Management and Transportation Plan including disposal facility names and permits, in accordance with SECTION 02 81 00 - TRANSPORTATION AND DISPOSAL OF WASTE MATERIAL.

During the Pre-Work Conference, briefly review these submittals to provide the Contracting Officer with a general understanding of the Contractor's plans for working at the site. The Contractor's schedule, particularly for the initial startup period, must be discussed. Questions concerning the administrative requirements outlined during the Pre-Construction Conference or any other aspect of the project may also be addressed.

1.6 PRE-CONSTRUCTION QUALITY CONTROL CONFERENCE (MUTUAL UNDERSTANDING MEETING)

After the Pre-Work Conference and before start of construction, a Pre-Construction Quality Control Conference must be held between the Contractor and the Contracting Officer in accordance with SECTION 01 45 00.00 - CONTRACTOR QUALITY CONTROL.

1.7 PRE-CONSTRUCTION SAFETY CONFERENCE

Meet with the Contracting Officer for a Pre-Construction Safety Conference before the start of construction. The purpose of this conference is to discuss how work will be safely executed, including, but not limited to, work procedures, safety considerations associated with those work procedures, heavy equipment to be used, training required to operate this

equipment, and other safety requirements, such as training to be conducted and safety equipment to be used.

1.8 PROJECT PROGRESS MEETINGS

Schedule and administer Project Progress Meetings a minimum of once per week during active field activities, such as groundwater screening, well installation, and amendment injection, in addition to any other meetings requested by either the Contracting Officer or the Contractor during any stage of this project when it is deemed necessary to raise any significant questions, establish new guidelines, introduce a new aspect of the project, or discuss any other items that will affect the progress of work. The Contractor and all necessary personnel, as determined by the Contracting Officer, must attend these meetings for the duration of this contract and are expected to include the following persons:

- a. EPA's remedial project manager.
- b. The United States Army Corps of Engineers (USACE).
- c. NJDEP project manager or representative, as necessary.
- d. The Contractor's site superintendent.
- e. The Contractor's project manager.
- f. The Contractor's quality control manager and/or key quality control staff.
- g. The Contractor's safety and health manager and/or site safety and health officer.
- h. Subcontractors as appropriate to the agenda.
- i. Suppliers as appropriate to the agenda.
- j. Others as requested by the Contracting Officer or as appropriate to the agenda.

1.9 MOBILIZATION

Mobilize to the jobsite within 60 calendar days of contract award. Mobilize is defined as having equipment and having a physical presence of at least one person from the Contractor's team on the jobsite.

PART 2 PRODUCTS

2.1 DIGITAL CAMERA

Supply a minimum of one digital camera to produce project photographs as described in SECTION 01 50 00 - TEMPORARY CONSTRUCTION FACILITIES AND UTILITIES.

2.2 PHOTOGRAPHIC LOGBOOK

Keep all written documentation concerning project photographs in a photographic logbook. The logbook must be constructed of water-resistant paper and bound along the left edge.

PART 3 EXECUTION

3.1 SITE SAFETY

The Contractor is responsible for the safe operation of the work at the Site. Employ a Safety and Health Manager (SHM) and an SSHO. These individuals are responsible for the administration of site health and safety and have responsibilities as defined in SECTION 01 35 29 - HEALTH, SAFETY, AND EMERGENCY RESPONSE PROCEDURES.

3.2 QUALITY CONTROL

The Contractor is responsible for the overall management of quality control. Employ a Contractor Quality Control System Manager (CQCSM) who has the authority to act in all quality control matters for the Contractor. The CQCSM is responsible for quality control as defined in SECTION 01 45 00.00 - CONTRACTOR QUALITY CONTROL.

3.3 PROJECT MANAGEMENT AND RECORDKEEPING

Provide a project management team including a Project Manager and administrative personnel qualified and capable of managing the project, including supervising construction, expediting labor relations, staffing, and recordkeeping. Submit a detailed Project Organizational Chart showing the individuals directly involved in the project.

The Project Manager has overall responsibility for conducting the work and for ensuring that the work is conducted in accordance with the requirements of the Contract Documents. The Project Manager is responsible for communication with the Contracting Officer and will officially represent the Contractor in all project-related activities. The Project Manager has the authority to sign payments and change orders. Provide the name and experience of the Project Manager.

Provide a data retrieval recordkeeping system approved by the Contracting Officer, which must make available in a timely manner records of all site activity; quantities of materials delivered to the site; quantities of materials utilized; quantities of amendment injected; quantities of waste produced; laboratory results; waste transportation information; and all other information required by the Government.

A minimum of 14 calendar days before mobilization, the Project Manager may be required to meet City of Newark officials and business owners with permission from the Government, and, in the presence of the EPA, to discuss the planned construction approach and phasing of work. Record the minutes of the meeting(s) and include all significant proceedings and decisions. Items to be discussed must include, but are not limited to:

- a. Planned construction methods and sequence.
- b. Type and size of equipment and operating procedures, including heavy equipment operations and mechanical equipment operations.
- c. Effects of construction on overhead and buried utilities.
- d. Community protection requirements.
- e. Temporary traffic control patterns.

- f. Planned work hours.
- g. Emergency contact procedures.

3.4 PHOTOGRAPHIC DOCUMENTATION

In addition to obtaining photographic documentation for the project, obtain video documentation in accordance with SECTION 01 32 36 - VIDEO MONITORING AND DOCUMENTATION.

3.4.1 Project Photographs

Furnish digital photographs in an electronic file format approved by the Government, taken with a digital camera by an experienced photographer using suitable equipment as identified in Paragraph 2.1, to record the important features of the site prior to the commencement of work, during construction, and after the work has been completed.

Take a minimum of 20 digital photographs each week throughout the entire project from a minimum of ten different viewpoints. These viewpoints must be selected by the Contractor unless otherwise directed by the Contracting Officer. Submit, prior to or with the first digital photograph submittals, a sketch or drawing indicating the required photographic locations. Update as required if the locations are moved.

Photographs must illustrate condition and location of work and the state of progress. During successive periods of photography, take at least one photograph from the same reference point as previously required. Consult with the Contracting Officer during each period of photography for recommendations concerning views required. The actual number and location of views to be taken for the entire project must be as directed by the Contracting Officer.

3.4.1.1 Pre-Construction Photographs

Prior to the commencement of work, take pre-construction photographs depicting existing site conditions. Coverage must include, but not be limited to, property boundary lines, all existing roadways and driveways, aboveground utilities, existing monitoring wells, structures, landscaping, trees, signage and other physical features located within the zone of influence of the construction. The coverage may be expanded if directed by the Contracting Officer.

3.4.1.2 Progress Photographs

After construction operations have been started at the site, photographically record the project. Each progress photograph must be a separate electronic file. Progress photographs must include coverage of the following:

- a. Site preparation activities.
- b. Staging area and temporary access road
- c. Groundwater screening borings and sampling
- d. Monitoring, injection, and extraction well installation and development
- e. Amendment injection system

- f. Baseline sampling
- g. Amendment injection
- h. Performance sampling
- i. Any follow-up amendment injections
- j. Handling, transportation, and disposal of wastes generated
- k. Site restoration.
- l. Decontamination of equipment and personnel
- m. Demobilization.
- n. Unanticipated events such as spillage of container contents or related accidents.

3.4.1.3 Post-Construction Photographs

After completion of work, take digital photographs of the site. The Contracting Officer will designate the locations.

3.4.2 Electronic Files for Digital Photographs

Download digital photographs from the digital camera to a personal computer, at a minimum, daily during photographic sessions for transfer to an electronic file format. The electronic file must be in JPEG format, with minimum compression applied.

Rename each downloaded electronic file at the time of download with a distinct filename that corresponds to the photographic logbook specified in Paragraph 3.4.3 herein. The filename must have the following format as defined below:

yyyy-mm-dd_hhnn_xxx

- a. "yyyy" is the year the photograph was taken
- b. "mm" is the month the photograph was taken
- c. "dd" is the day the photograph was taken
- d. "hh" is the hour the photograph was taken using military time
- e. "nn" is the minute the photograph was taken using military time
- f. "xxx" is a three-digit sequential number, starting with 001, for each photograph taken during a given time period.

An example of the above filename format is 2022-07-15_1845_002. This example photograph filename would have been applied to the second photo taken at 6:45 p.m. on July 15, 2022.

Copy the electronic files to a compact disc after renaming each file as described in the paragraph above. The compact disc must be "CD-R" format.

- a. Submit two sets of digital photographs, each on a separate "CD-R" format compact disc.
- b. Complete the copy process on the same day the photographs are downloaded, except as approved by the Government.
- c. If the Contracting Officer allows the copy process to be delayed, backup the electronic files on at least one storage device other than the hard drive of the personal computer storing the electronic files until the copy process is completed.

Submit compact discs containing electronic files of digital photographs a minimum of once weekly during photographic sessions.

All digital photographs and related electronic files are U. S. Government property and must not be released by the Contractor to the public or news media.

3.4.3 Logbook Documentation of Digital Photographs

Record pertinent information concerning digital photographs in a photographic logbook as specified in Paragraph 2.2 herein. Use waterproof ink for writing.

Record the following information on the front cover of the logbook:

- a. Project name.
- b. Contract number.
- c. Contractor name.

Include the following information for each photographic entry, at a minimum:

- a. Date.
- b. Time.
- c. Photograph filename.
- d. Location.
- e. Direction.
- f. Description.

3.5 CONFERENCE REQUIREMENTS

Schedule and administer the Pre-Construction Conference, Pre-Work Conference, Pre-Construction Quality Control Conference (Mutual Understanding Meeting), and Pre-Construction Safety Conference, as specified in Paragraphs 1.4 through 1.7 herein.

Only the Contracting Officer has the authority to issue modifications or otherwise change the terms and conditions of this contract. If another individual attempts to make changes to the terms and conditions of this contract, do not proceed with the change and immediately notify the

Contracting Officer.

Record the minutes of the meetings and submit the conference meeting minutes, as specified in Paragraph 1.2. After the Contracting Officer's review and approval, distribute copies to each participant in the meeting and to parties affected by decisions made at the meeting.

Administer the following general requirements for the conference meetings:

- a. Prepare agendas for the conferences.
- b. Make physical arrangements for the conferences.
- c. Preside at the conferences.
- d. Record the minutes, including a detailed description of proceedings and decisions.
- e. Record action items and designate responsible parties for each action item

3.6 PROJECT PROGRESS MEETING REQUIREMENTS

Schedule and administer Project Progress Meetings as specified in Paragraph 1.8 herein.

Record the minutes of all Project Progress Meetings, including any significant proceedings and decisions and providing to the Government as indicated in Paragraph 1.2. After the Contracting Officer's review and approval, distribute copies to each participant in the meeting and to parties affected by decisions made at the meeting.

Meetings must take place at the project site or some other location that is satisfactory to both the Contracting Officer and the Contractor. Provide a conference call-in option for meeting participants calling in remotely, with the approval of the Contracting Officer.

Administer the following general requirements for the Project Progress Meetings:

- a. Prepare the agenda for meetings.
- b. Make physical arrangements for meetings.
- c. Preside at meetings.
- d. Record the minutes, including a detailed description of proceedings and decisions.

The following is a suggested agenda for Project Progress Meetings; modify this agenda in accordance with ongoing work:

- a. Review and approval of the minutes and status of action items from the previous meeting.
- b. Review of health and safety issues.
- c. Review of work progress.

- d. Permit activities.
- e. Field observations, problems, and conflicts.
- f. Problems which impede the schedule and proposed corrective actions.
- g. Review and revision of the project schedule, including:
 - 1) Review of problems and proposed changes for their effect on construction, completion date, and other contracts of the project, and corrective actions proposed to regain the projected schedule.
 - 2) Review of offsite materials and equipment delivery schedules.
 - 3) Coordination of submittal schedules, including review and expedition, as required.
 - 4) Planned progress during the succeeding work period based on the current project schedule.
 - 5) Milestone dates.
- h. Review of transmittals submitted to the Contracting Officer, submittals returned from the Contracting Officer, transmittals pending re-submittal, and requests for information (RFIs).
- i. Review of quality control, including all completed inspections (Preparatory Phase, Initial Phase, Follow-Up Phase, Pre-Final, and Final), scheduled inspections, and the deficiency tracking system.
- j. Pending and proposed changes and substitutions.
- l. Community relations issues.
- m. Review of old business.
- n. Review of new business.
- o. Assignment of action items.
- p. Decision of other business, as appropriate.

3.7 WORKING HOURS

Working hours must be scheduled by the Contractor to occur between 7:00 am to 7:00 pm, Monday through Friday. Work before 7:00 am or after 7:00 pm is not permitted unless approved by the Government.

The Contractor may be permitted to conduct construction activities six days per week, Monday through Saturday, with the approval of the Contracting Officer.

Written notification of any changes to the normal work schedule, including work before 7:00 am, after 7:00 pm, or on Saturdays, must be submitted to the Government at least one (1) week in advance of proposed changes.

-- End of Section --

SECTION 01 32 01.00 10

PROJECT SCHEDULE

PART 1 GENERAL

1.1 SCOPE OF WORK

Furnish all labor, materials, equipment, and incidentals required to prepare and update critical path method project schedules and prepare the weekly progress reports for review at the Pre-Construction Conference and subsequent progress meetings.

Prepare and update the Contractor's Project Schedule using a computer software system that produces legible, easily updated critical path schedules. The software must be capable of providing a bar chart type schedule for use by the Government in interactions with the public and for discussion at progress meetings.

1.2 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only. Where reference is made to one of these standards, the revision in effect at the time of contract award applies.

U.S. ARMY CORPS OF ENGINEERS (USACE)

ER 1-1-11

Progress, Schedules, and Network Analysis
Systems

1.3 QUALITY ASSURANCE

Designate an authorized representative who is responsible for the preparation of all required project schedule reports. The authorized representative must be experienced in scheduling projects similar in nature to this project and must be experienced in the use of the scheduling software that meets the requirements of this specification.

1.4 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals having an "FIO" designation are for information only. Submit the following to the Contracting Officer in accordance with SECTION 01 33 00 - SUBMITTAL PROCEDURES.

Provide the project schedule submissions as described below. The data disk, reports, and network diagrams required for each submission are contained in Paragraph 3.4.

SD-01 Preconstruction Submittals

Project Scheduler Qualifications; G

Designate an authorized representative to be responsible for the preparation of the schedule and all required updating and production of reports. The authorized representative must have a minimum of

2-years experience scheduling construction projects similar in size and nature to this project with scheduling software that meets the requirements of this specification. The representative must have a comprehensive knowledge of critical path method (CPM) scheduling principles and application.

Preliminary Project Schedule; G

Submit the Preliminary Project Schedule, defining the Contractor's planned operations for the first 90 calendar days, for approval within 14 calendar days after the task order award is acknowledged. Completely cost load the Preliminary Project Schedule to balance the contract award Bid Item shown on the Price Schedule. The Preliminary Project Schedule forms the basis for the Initial Project Schedule specified herein. Include all of the required Plan and Program preparations, submissions, and approvals identified in the contract (for example, Contractor Quality Control Plan, Accident Prevention Plan/ Site Safety and Health Plan, and Environmental Protection Plan), permitting activities, design activities, planned submissions of all early design packages, design review conference activities, and other non-construction activities intended to occur within the first 90 calendar days. Any construction activities planned for the first 90 calendar days must be scheduled after the task order award is acknowledged. Government acceptance of other specified Program and Plan approvals must occur prior to any planned construction activities and therefore constrain construction activities.

Initial Project Schedule; G

Submit the Initial Project Schedule for approval at least 14 calendar days prior to the Pre-Work Conference. The schedule must provide a reasonable sequence of activities, which represent work through the entire project and must be at a reasonable level of detail.

SD-03 Product Data

Periodic Schedule Update; G

Based on the results of progress meetings, specified in Paragraph 3.5 - PERIODIC PROGRESS MEETINGS, submit periodic schedule updates. These submissions will enable the Government to assess the Contractor's progress. If the Contractor fails or refuses to furnish the project schedule data that, in the judgment of the Government, are necessary for verifying the Contractor's progress, the Contractor will be deemed not to have provided an estimate upon which progress payment may be made.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.1 GENERAL REQUIREMENTS

Prepare a project schedule as described herein. In the schedule, show the proposed sequence to perform the work and dates contemplated for starting and completing all schedule activities. The scheduling of the entire project is required. The scheduling of design and construction is the responsibility of the Contractor. Contractor management personnel must actively participate in its development. Designers, Subcontractors and

suppliers working on the project should also contribute in developing and maintaining an accurate Project Schedule.

The approved Project Schedule will be used to measure the progress of the work and to aid in evaluating time extensions.

3.1.1 Approved Project Schedule

Use the approved Project Schedule to measure the progress of the work and to aid in evaluating time extensions. The schedule must be cost loaded and activity coded.

3.1.2 Schedule Status Report

Provide a Schedule Status Report on at least a monthly basis. If, in the opinion of the Contracting Officer, the Contractor falls behind the approved schedule, take steps necessary to improve progress, including those that may be required by the Contracting Officer. In this circumstance, the Contracting Officer may require the Contractor to increase the number of shifts, overtime operations, days of work, and/or the amount of construction planned, and to submit for approval any supplementary schedule or schedules as the Contracting Officer deems necessary to demonstrate how the approved rate of progress will be regained. Artificially improving progress by means such as, but not limited to, revising the schedule logic, modifying or adding constraints, shortening activity durations, or changing calendars in the project schedule is prohibited. Failure to perform work and maintain progress in accordance with the supplemental recovery plan may result in an interim and final unsatisfactory performance rating and may result in corrective action directed by the Contracting Officer.

3.1.3 Default Terms

Failure of the Contractor to comply with the requirements of the Government will be grounds for a determination by the Contracting Officer that the Contractor is not prosecuting the work with sufficient diligence to ensure completion within the time specified in the contract. Upon making this determination, the Contracting Officer may terminate the Contractor's right to proceed with the work, or any separable part of it, in accordance with the default terms of the contract.

3.2 ACTIVITY COST LOADING

Perform reasonable activity cost loading as determined by the Contracting Officer without front-end loading. Provide additional documentation to demonstrate reasonableness if requested by the Contracting Officer. Failure of the Contractor to provide all required information will result in the disapproval of the preliminary, initial and subsequent schedule updates. The aggregate value of all activities coded to a contract bid item must equal the value of the bid item on the Schedule.

3.3 PROJECT SCHEDULE

The computer software system utilized by the Contractor to produce the Project Schedule must be capable of meeting all requirements of this specification. Failure of the Contractor to meet the requirements of this specification will result in the disapproval of the schedule. Manual methods used to produce any required information require approval by the Government.

3.3.1 Critical Path Method

Use the CPM of network calculation to generate the Project Schedule. Provide the Project Schedule in the Precedence Diagram Method (PDM).

3.3.2 Level of Detail Required

Develop the Project Schedule to the appropriate level of detail to address major milestones and to allow for satisfactory project planning and execution. Failure to develop the Project Schedule to an appropriate level of detail will result in its disapproval. The Contracting Officer will use, but is not limited to, the following conditions to determine the appropriate level of detail to be used in the Project Schedule.

3.3.2.1 Activity Durations

Follow the direction of the Contracting Officer regarding reasonable activity durations. Reasonable activity durations are those that allow the progress of ongoing activities to be accurately determined between update periods. Less than 2 percent of all non-procurement activities may have Original Durations (OD) greater than 20 work days or 30 calendar days.

3.3.2.2 Design and Permit Activities

Integrate design and permitting activities, including necessary conferences and follow-up actions and design package submission dates into the schedule.

3.3.2.3 Procurement Activities

Include activities associated with the critical submittals and their approvals, procurement, fabrication, and delivery of long lead materials, equipment, fabricated assemblies, and supplies. Long lead procurement activities are those with an anticipated procurement sequence of over 90 calendar days.

3.3.2.4 Workers Per Day

Assign Workers per Day for all field construction or direct work activities if directed by the Contracting Officer. Workers per Day is based on the average number of workers expected each day to perform a task for the duration of that activity.

3.3.2.5 Mandatory Tasks

At a minimum, include the following activities/tasks in the initial project schedule and all updates.

- a. Submission, review and acceptance of SD-01 Preconstruction Submittals (individual activity for each)
- b. Permitting
- c. Mobilization
- d. Access road construction
- e. Initial survey

- f. Existing Well Assessment and Modification
- g. Groundwater Screening
- h. Well Installation
- i. Baseline groundwater sampling
- j. Amendment injection (for both overburden and bedrock aquifers)
- k. Treatment performance sampling
- l. Site Restoration
- m. Contractors pre-final inspection
- n. Correction of punch list from Contractor's pre-final inspection
- o. Government's pre-final inspection
- p. Correction of punch list from Government's pre-final inspection
- q. Final inspection
- r. Project close-out submittal and demobilization

3.3.2.6 Government Activities

Show Government and other agency activities that could impact progress. These activities include, but are not limited to: approvals, permit application reviews, permit approvals by State/local regulators, inspections, utility tie-in, Government Furnished Equipment (GFE) and task order award for phasing requirements.

3.3.2.7 Standard Activity Coding Dictionary

Use the activity coding structure defined in the Standard Data Exchange Format (SDEF) in [ER 1-1-11](#). This exact structure is mandatory. Develop and assign all Activity Codes to activities as detailed herein. A template SDEF compatible schedule backup file is available on the QCS web site: <http://rms.usace.army.mil>.

The SDEF format is as follows:

Field	Activity Code	Length	Description
1	WRKP	3	Workers per day
2	RESP	4	Responsible party
3	AREA	4	Area of work
4	MODF	6	Modification Number

White Chemical Corporation Superfund Site, OU3
Final 100% Remedial Design

Field	Activity Code	Length	Description
5	BIDI	6	Bid Item (CLIN)
6	PHAS	2	Phase of work
7	CATW	1	Category of work
8	FOW	20	Feature of work*
*Some systems require that FEATURE OF WORK values be placed in several activity code fields. The notation shown is for Primavera P6. Refer to the specific software guidelines with respect to the FEATURE OF WORK field requirements.			

3.3.2.8 Responsibility

Identify all activities in the Project Schedule by the party responsible to perform the work. Responsible parties include, but are not limited to, the subcontracting firm, contractor work force, or government agency performing a given task. Activities must not belong to more than one responsible party. Identify the responsible party for each activity by the Responsibility Code. Examples of acceptable activity code values are: DOR (for the designer of record); ELEC (for the electrical subcontractor); MECH (for the mechanical subcontractor); and GOVT (for USACE).

3.3.2.9 Work Areas

Identify all activities in the Project Schedule by the work area in which the activity occurs. Define work areas based on resource constraints or space constraints that would preclude a resource, such as a particular trade or craft work crew from working in more than one work area at a time. Examples of Work Area Coding include different areas within a floor of a building, different floors within a building, and different buildings within a complex of buildings. Activities must not cover more than one work area. Identify the work area of each activity by the Work Area Code.

Not all activities are required to be Work Area coded. A lack of Work Area coding indicates the activity is not resource or space constrained.

3.3.2.10 Contract Changes/Request for Equitable Adjustment (REA) Coding

Assign an activity code to any activity or sequence of activities added to the schedule as a result of a Contract Modification, when approved by the Government, with a Contract Changes/REA Code. Key all Code values to the Government's modification numbering system. Any activity or sequence of activities added to the schedule as a result of alleged constructive changes made by the Government may be added to a copy of the current schedule, subject to Government approval. Assign activity codes for these activities with a Contract Changes/REA Code. Key the code values to the Contractor's numbering system. Approval to add these activities does not necessarily mean the Government accepts responsibility and therefore liability for such activities and any associated impacts to the schedule, but rather the Government recognizes such activities are appropriately added to the schedule for the purposes of maintaining a realistic and meaningful schedule. Do not Responsibility Code such activities to the Government unless approved. Do not assign more than one Contract

Changes/REA Code to an activity.

3.3.2.11 Bid Item

Identify all activities in the Project Schedule by the Bid Item to which the activity belongs. An activity must not contain work in more than one Bid Item. Identify the Bid Item for each appropriate activity by the Bid Item Code.

3.3.2.12 Phase of Work

Identify all activities in the Project Schedule by the phase of work in which each activity occurs. Examples of phases of work are design phase, procurement phase and construction phase. Activities must not contain work in more than one phase of work. Identify the project phase of each activity by the unique Phase of Work Code.

3.3.2.13 Category of Work

Identify all activities in the Project Schedule according to the category of work which best describes the activity. Category of Work Codes include, but are not limited to design, design submittal, design reviews, review conferences, permits, construction submittal, procurement, fabrication, weather sensitive installation, non-weather sensitive installation, start-up, and testing activities. Identify the category of work for each activity by the Category of Work Code.

3.3.2.14 Feature of Work

Identify all activities in the Project Schedule according to the feature of work to which the activity belongs. "Definable Feature of Work" is defined in SECTION 01 45 00.00 - CONTRACTOR QUALITY CONTROL. Identify the feature of work for each activity by the Feature of Work Code. An activity can have only one Feature of Work Code.

3.3.3 Scheduled Project Completion and Activity Completion

Extend the schedule interval from the task order award date to the contract completion date. The contract completion activity (End Project) must finish based on the required contract duration in the accepted contract proposal, as adjusted for any approved contract time extensions. The first scheduled work period must be the day after task order award is acknowledged by the Contractor.

Schedule activities on a calendar to which the activity logically belongs. Activities may be assigned to a 7-day calendar when the contract assigns calendar day durations for the activity, such as a Government Acceptance activity. If the Contractor intends to perform physical work less than seven days per week, schedule the associated activities on a calendar with non-work periods identified, including weekends and holidays. Assign the Category of Work Code - Weather Sensitive Installation to those activities that are weather sensitive. Original durations must account for anticipated normal adverse weather. The Government will interpret all work periods not identified as non-work periods on each calendar as meaning the Contractor intends to perform work during those periods.

3.3.3.1 Project Start Date

The first activity in the project schedule must be a start milestone titled "Task Order Award Acknowledged," which must have a "Start On" constraint date equal to the date that the task order award is acknowledged.

3.3.3.2 Schedule Constraints and Open-Ended Logic

Constrain completion of the last activity in the schedule by the contract completion date. Calculation of project updates must be such that if the early finish of the last activity falls after the contract completion date, then the float calculation must reflect a negative float on the critical path. Include as the last activity in the Project Schedule an activity called "End Project". The "End Project" activity must have a "Late Finish" constraint date equal to the completion date for the project, and a zero-day duration. The schedule must have no constrained dates other than those specified in the contract. The use of artificial float constraints such as "zero free float" or "zero total float" are typically prohibited. Include only two open-ended activities in the schedule: Start Project (or task order award) with no predecessor logic and End Project with no successor logic.

3.3.3.3 Early Project Completion

In the event that the Project Schedule shows completion of the project prior to the contract completion date, identify those activities that have been accelerated and/or those activities that are scheduled in parallel to support the Contractor's "early" completion. The last activity must have a late finish constraint equal to the contract completion date and the schedule must calculate positive float. The Government will not approve an early completion schedule with zero float on the longest path. The Government is under no obligation to accelerate activities for which it is responsible to support a proposed early contract completion.

3.3.4 Interim Completion Dates

Constrain contractually-specified interim completion dates to show negative float if the early finish date of the last activity in that phase falls after the interim completion date.

3.3.4.1 Start Phase

Include as the first activity for a project phase an activity called "Start Phase X", where "X" refers to the phase of work. The "Start Phase X" activity must have an "ES" constraint date equal to the date on which the task order award was acknowledged, and a zero-day duration.

3.3.4.2 End Phase

Include as the last activity in a project phase an activity called "End Phase X", where "X" refers to the phase of work. The "End Phase X" activity must have an "LF" constraint date equal to the completion date for the project phase, and a zero-day duration.

3.3.4.3 Phase "X" Hammock

Include a hammock-type activity for each project phase called "Phase X", where "X" refers to the phase of work. The "Phase X" hammock activity must

be logically tied to the earliest and latest activities in the phase.

3.3.5 Default Progress Data Disallowed

Actual Start and Finish dates must not be automatically updated by default mechanisms that may be included in CPM scheduling software systems. Actual Start and Finish dates on the CPM schedule must match those dates provided by Contractor Quality Control Reports. Failure of the Contractor to document the Actual Start and Finish dates on the Daily Quality Control Report for every in-progress or completed activity, and failure to ensure that the data contained in the Daily Quality Control Reports are the sole basis for schedule updating, will result in the disapproval of the Contractor's schedule. Updating of the percent complete and the remaining duration of any activity must be independent functions. Disable program features which calculate one of these parameters from the other.

3.3.6 Out-of-Sequence Progress

Activities that have posted progress without all preceding logic being satisfied will be allowed only on a case-by-case basis approved by the Government. Propose logic corrections to eliminate all out-of-sequence progress or justify not changing the sequencing for approval prior to submitting an updated project schedule.

3.3.7 Added and Deleted Activities

Do not delete activities from the project schedule and do not add new activities to the schedule without approval from the Contracting Officer. Activity ID and description changes are considered new activities and cannot be changed without Contracting Officer approval.

3.3.8 Negative Lags and Start to Finish Relationship

Lag durations contained in the Project Schedule must not have a negative value. Do not use Start to Finish relationships.

3.3.9 Calculation Mode

Schedule calculations must retain the logic between predecessors and successors even when the successor activity starts, and the predecessor activity has not finished. Software features that in effect sever the tie between predecessor and successor activities when the successor has started, and the predecessor logic is not satisfied ("progress override") will not be allowed.

3.3.10 Milestones

Include milestone activities in the schedule for each significant project event including but not limited to: permitting; mobilization and demobilization; site preparation; groundwater screening; monitoring well installation and development; overburden amendment injection; bedrock amendment injection; site restoration; and performance monitoring.

3.3.10.1 Project Start Date Milestone and Constraint

As the first activity in the project schedule, include a start milestone titled "Task Order Award Acknowledged," which must have a "Start On" constraint date equal to the date that the task order award is acknowledged.

3.3.10.2 End Project Finish Milestone and Constraint

As the last activity in the schedule, include a finish milestone titled "End Project."

Constrain the project schedule to the Contract Completion Date in such a way that if the schedule calculates an early finish, then the float calculation for "End Project" milestone reflects positive float on the longest path. If the project schedule calculates a late finish, then the "End Project" milestone float calculation reflects negative float on the longest path. The Government is under no obligation to accelerate Government activities to support a Contractor's early completion.

3.4 SUBMISSION REQUIREMENTS

Submit the following items for the preliminary schedule, initial schedule, and every periodic project schedule update throughout the duration of the project.

3.4.1 Data CDs

Provide two sets of data CDs containing the project schedule in the backup format. Include on each CD all previous update backup files. The file medium must be CD. Label each CD indicating the type of schedule (Preliminary, Initial, Update), full contract number, project name, data date and file name. Each schedule must have a unique file name as determined by the Contractor and must use project specific settings.

3.4.2 Narrative Report

Provide a Narrative Report with the preliminary, initial, and each periodic schedule update of the Project Schedule. The narrative report is expected to communicate to the Government the Contractor's thorough analysis of the schedule output and its plans to compensate for any problems, either current or potential, which are revealed through that analysis. Include the following information as minimum in the Narrative Report:

- a. The identification and discussion of the work scheduled to start in the next update period.
- b. A description of activities along the two most critical paths where the total float is less than or equal to 20 work days.
- c. A description of current and anticipated problem areas or delaying factors and their impact and an explanation of corrective actions taken or required to be taken.
- d. The identification and explanation why activities based on their calculated late dates should have either started or finished during the update period but did not.
- e. The identification and discussion of all schedule changes by activity ID and activity name including what specifically was changed and why the change was needed. Include at a minimum new and deleted activities, logic changes, duration changes, calendar changes, lag changes, resource changes, and actual start and finish date changes.

- f. The identification and discussion of all out-of-sequence work.

3.4.3 Approved Changes Verification

Include only project schedule changes that have been previously approved by the Government in the schedule submission. Specifically reference in the Narrative Report, on an activity-by-activity basis, all changes made since the previous period and relate each change to documented, approved schedule changes.

3.4.4 Schedule Reports

Include the following in the format for each activity for the schedule reports listed below: Activity Numbers, Activity Description, Original Duration, Remaining Duration, Early Start Date, Early Finish Date, Late Start Date, Late Finish Date, and Total Float. Include Actual Start and Actual Finish Dates for those activities in progress or completed. The following lists typical reports that will be requested. One or all of these reports may be requested for each schedule submission.

3.4.4.1 Activity Report

A list of all activities sorted according to activity number.

3.4.4.2 Logic Report

A list of detailed predecessor and successor activities for every activity in ascending order by activity number.

3.4.4.3 Total Float Report

A list of all incomplete activities sorted in ascending order of total float. List activities which have the same amount of total float in ascending order of Early Start Dates. Do not show completed activities on this report.

3.4.4.4 Earnings Report by CLIN

A compilation of the Contractor's Total Earnings on the project from the Task Order Award until the most recent Monthly Progress Meeting. This report must reflect the earnings of specific activities based on the agreements made in the field and approved between the Contractor and Government at the most recent Monthly Progress Meeting. Activities must be grouped by bid item and sorted by activity numbers. This report must sum all activities in a bid item and provide a bid item percent, and complete and sum all bid items to provide a total project percent complete. The printed report must contain, for each activity, the following: the Activity Number, Activity Description, Original Budgeted Amount, Total Quantity, Quantity to Date, Percent Complete (based on cost), and Earnings to Date.

3.4.5 Network Diagram

A network diagram is required for the Preliminary, Initial and Periodic Updates. The network diagram must depict the order and interdependence of activities and the sequence in which the work is to be accomplished. The Government will use, but is not limited to, the following conditions to review compliance with this paragraph.

3.4.5.1 Continuous Flow

Diagrams must show a continuous flow from left to right with no arrows from right to left. Show the activity number, description, duration, and estimated earned value on the diagram.

3.4.5.2 Project Milestone Dates

Show dates on the diagram for start of project, any contract-required interim completion dates, and contract completion date.

3.4.5.3 Critical Path

Show all activities on the critical path. The critical path is defined as the longest path.

3.4.5.4 Banding

Organize activities using the work breakdown structure or as otherwise directed to assist in the understanding of the activity sequence. Typically, this flow will group activities by major elements of work, category of work, work area and/or responsibility.

3.4.5.5 Cash Flow / Schedule Variance Control (SVC) Diagram

With each schedule submission, provide a SVC diagram showing 1) Cash Flow S-Curves indicating planned project cost based on projected early and late activity finish dates, and 2) Earned Value to-date.

3.5 PERIODIC PROGRESS MEETINGS

Periodic progress meetings include onsite meetings conducted monthly or at other regular intervals mutually agreed to at the Pre-Construction Conference. During this meeting describe, on an activity-by-activity basis, all proposed revisions and adjustments to the Project Schedule required to reflect the current status of the project. The Government will approve activity progress, proposed revisions, and adjustments as appropriate.

3.5.1 Meeting Attendance

The Contractor's Project Manager, Scheduler, and Project Cost Account must attend the periodic progress. Superintendents, foremen and major subcontractors must attend the meeting as required to discuss the project schedule and work.

3.5.2 Update Submission Following Progress Meeting

Submit a complete update of the Project Schedule containing all approved progress, revisions, and adjustments, based on the regular progress meeting, not later than four business days after the monthly progress meeting.

3.5.3 Progress Meeting Contents

Updated information, including Actual Start Dates, Actual Finish Dates, Remaining Durations, and Cost-to-Date will be subject to Government approval. At a minimum, address the following items on an activity-by-activity basis during each progress meeting.

3.5.3.1 Actual Start and Finish Dates

The Actual Start and Actual Finish Dates for each activity currently in progress or completed. The Contracting Officer may allow an Actual Finish Date to be assigned with the percent complete less than 100% to account for the value of work remaining but not restraining successor activities. Only assign Actual Start dates when actual progress occurs on an activity.

3.5.3.2 Remaining Duration

The estimated Remaining Duration for each activity in progress. Base time-based progress calculations on Remaining Duration for each activity.

3.5.3.3 Percent Complete

The updated percent complete for each activity started, based on the realistic assessment of earned value. Activities which are complete but for remaining minor punch list work and which do not restrain the initiation of successor activities may be declared 100 percent complete. To allow for proper schedule management, cost load the correction of punch list items from the Government's pre-final inspection activities not less than 1 percent of the total contract value, which activities may be declared 100 percent complete and correction of all punch list work identified during the Government's pre-final inspection.

3.5.3.4 Logic Changes

Specifically identify and discuss all logic changes pertaining to task order award on change orders, change orders to be incorporated into the schedule, Contractor-proposed changes in work sequence, corrections to schedule logic for out-of-sequence progress, lag durations, and other changes that have been made pursuant to contract provisions.

3.5.3.5 Other Changes

Other changes required due to delays in completion of any activity or group of activities include:

- a. Delays due to conditions beyond the Contractor's control, such as strikes and unusual weather
- b. Delays encountered due to submittals, Government activities, deliveries or work stoppages which make re-planning the work necessary
- c. Changes required to correct a schedule which does not represent the actual or planned progress of the work

3.6 CONSTRUCTION PROGRESS MEETINGS

3.6.1 Progress Review

Discuss the project schedule during the construction progress meetings for the purpose of jointly reviewing the actual progress of the project as compared to the planned progress and to review planned activities for the upcoming two weeks. The current and approved schedule update will be used for the purposes of this meeting and for the production and review of reports. The Contractor's Project Manager and the Authorized Representative of the Government must attend. The progress meeting must

address the status of Requests for Information and Submittals.

3.6.2 Bar Chart

Provide a bar chart produced by the scheduling software, organized by Total Float and sorted by Early Start Date, and a two-week "look-ahead" schedule by filtering all schedule activities to show only current ongoing activities and activities scheduled to start during the upcoming two weeks, sorted by Early Start Date. Include the following alongside the bar chart.

- a. A list of affected activities, with their associated project schedule activity number
- b. A brief explanation of the causes of the change
- c. An analysis of the overall impact of the changes proposed
- d. A sub-network of the affected area

Activities impacted in each justification for change must be identified by a unique activity code contained in the required data file.

3.6.3 Corrective Action

The Government and the Contractor must jointly review the reports. If it appears that activities on the longest path(s) which are currently driving the calculated completion date (driving activities) are not progressing satisfactorily and therefore could jeopardize timely project completion, take corrective action immediately. Corrective action includes but is not limited to: increasing the number of work crews; increasing the number of work shifts; increasing the number of hours worked per shift; and determining if Government responsibility-coded activities require Government corrective action.

3.7 REQUESTS FOR TIME EXTENSIONS

Provide a justification of delay to the Contracting Officer in accordance with the contract provisions and clauses for approval within 10 days of a delay occurring. Also prepare a time impact analysis for each Government RFP to justify time extensions.

3.7.1 Justification of Delay

Provide a description of the event(s) that caused the delay and/or impact to the work. As part of the description, identify all schedule activities impacted. Show that the event that caused the delay/impact was the responsibility of the Government. Provide a time impact analysis that demonstrates the effects of the delay or impact on the project completion date or interim completion date(s). Evaluate multiple impacts chronologically; each with its own justification of delay. With multiple impacts, consider any concurrency of delay. A time extension and the schedule fragnet becomes part of the project schedule and all future schedule updates upon approval by the Contracting Officer.

Clearly display in the Project Schedule that all the float time available for the work involved with this request has been used in full. The Government's determination as to the number of allowable days of contract extension will be based upon the project schedule updates in effect for

the time period in question and other factual information. Actual delays that are found to be caused by the Contractor's own actions, which result in the extension of the schedule, will not be a cause for a time extension to the performance period, contract completion date, or other interim milestone date.

3.7.2 Time Extension

No time extension may be granted until the Contracting Officer approves the Justification of Delay including the time impact analysis. No time extension will be granted unless the delay consumes all available Project Float and extends the projected finish date ("End Project" milestone) beyond the Contract Completion Date. The time extension will be in calendar days.

Actual delays that are found to be caused by the Contractor's own actions, which result in a calculated schedule delay will not be a cause for an extension to the performance period, completion date, or any interim milestone date.

3.7.3 Submission Requirements

Submit a justification for each request for a change in the contract completion date of under 14 calendar days based upon the most recent schedule update at the time of the task order award or constructive direction issued for the change. Submit such a request in accordance with the requirements of other appropriate Contract Clauses including, at a minimum:

- a. A list of affected activities, with their associated project schedule activity number
- b. A brief explanation of the causes of the change
- c. An analysis of the overall impact of the changes proposed
- d. A sub-network of the affected area

Identify activities impacted in each justification for change by a unique activity code contained in the required data file.

3.7.4 Additional Submission Requirements

For any requested time extension of over 14 calendar days, the Contracting Officer may request an interim update with revised activities for a specific change request. Provide this information on a disk within four calendar days of the Contracting Officer's request.

3.8 DIRECTED CHANGES

If the task order award is issued for changes prior to settlement of price and/or time, submit proposed schedule revisions to the Contracting Officer within 14 calendar days of the task order award being issued. The proposed revisions to the schedule will be approved by the Government prior to inclusion of those changes within the Project Schedule. If the Contractor fails to submit the proposed revisions, the Contracting Officer may furnish the Contractor with suggested revisions to the Project Schedule. Include these revisions in the Project Schedule until revisions are submitted and final changes and impacts have been negotiated. If the

Contractor has any objections to the revisions furnished by the Contracting Officer, advise the Contracting Officer within 14 calendar days of receipt of the revisions. Regardless of the objections, continue to update the schedule with the Contracting Officer's revisions until a mutual agreement regarding the revisions is reached. If the Contractor fails to submit alternative revisions within 14 calendar days of receipt of the Contracting Officer's proposed revisions, the Contractor will be deemed to have concurred with the Contracting Officer's proposed revisions.

3.9 OWNERSHIP OF FLOAT

Float available in the schedule, at any time, will not be considered for the exclusive use of either the Government or the Contractor including activity and/or project float. Activity float is the number of work days that an activity can be delayed without causing a delay to the "End Project" finish milestone. Project float (if applicable) is the number of work days between the projected early finish and the contract completion date milestone.

3.10 TRANSFER OF SCHEDULE DATA INTO RMS/QCS

Download and upload the schedule data into the Resident Management System (RMS)/Quality Control System (QCS) prior to RMS/QCS databases being transferred to the Government.

-- End of Section --

SECTION 01 32 36

VIDEO MONITORING AND DOCUMENTATION

PART 1 GENERAL

1.1 SCOPE OF WORK

Furnish all labor, materials, and equipment required to provide color, high-quality video/audio of the project site, recording the site features prior to the commencement of work and after the work has been completed and any important site features during construction. Under no circumstances may construction begin until the Contracting Officer has received and accepted the pre-construction video recording. This recording will be used for reference during restoration and as a record of pre-existing conditions should disputes or litigation arise.

The Contracting Officer reserves the right to reject the recording because of poor quality, unintelligible audio, or uncontrolled pan or zoom. Re-record and resubmit any recording rejected by the Contracting Officer to the Contracting Officer for acceptance prior to beginning construction.

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals with an "FIO" designation are for information only. Submit the following to the Contracting Officer in accordance with SECTION 01 33 00 - SUBMITTAL PROCEDURES.

SD-11 Closeout Submittals

Pre-Construction, Progress, and Post-Construction Video; FIO

Furnish to the Contracting Officer two copies of each recording. Each recording must be continuous, in color, and recorded in a digital format stored on Digital Video Disc (DVD) media. The discs must be written in accordance with the ISO-9660 Level 2 specification. Label each disc with the appropriate identification of its content.

1.3 VIDEO QUALITY

At a minimum, the video recording camera must be able to produce a resolution of 1,920 (pixel) x 1,080 (pixel) (HD 1080p) with a frame rate of 60 frames per second. Store video files in an industry standard Moving Pictures Expert Group (MPEG) format transferable to a DVD or to an external computer capable of playing MPEG files.

Video recording must be performed by a qualified, established video recording firm knowledgeable in construction practices and experienced in the implementation of established inspection procedures.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.1 VIDEO SURVEY

Furnish a continuous, color video recording along the construction limits.

Collect coverage including, but not limited to, all existing roadways and sidewalks, structures, aboveground utilities, landscaping, trees and other large vegetation, surface water pathways, signage, fencing, and other physical features located within the construction limits and any other adjacent properties. Collect video coverage extending a minimum of 100 feet in each direction from the site entrance. The required coverage may be expanded if directed by the Contracting Officer.

Accompany the videographer during recording sessions to indicate the adjacent areas of potential construction activity and identify items and conditions to be recorded. Flag the construction limits with survey stakes and/or high-visibility paint for identification prior to production of audio/video recordings.

Perform all recording during daylight hours. No recording may be performed if weather is not acceptable to the Contracting Officer.

To produce the proper detail and perspective, use artificial lighting where it is necessary to illuminate the shaded area caused by trees, utility poles, road signs, adjacent buildings, and other such objects.

3.2 AUDIO AND VIDEO

Audio/video media must be professional-grade DVD in National Television Standards Committee (NTSC) format.

Label each DVD with the contract name and number, Contractor's name, date, and location information such as street name, direction of travel, viewing side, etc.

Information appearing on the DVD must be continuous, and no editing or overlaying of information at a later date will be acceptable.

Include the following information on each video recording:

a. Upper left portion:

- 1) Name of Contractor.
- 2) Day, date, and time.
- 3) Name of project.

b. Lower left portion:

- 1) Route of travel.
- 2) Viewing side.
- 3) Direction of travel.

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Time must be accurate to within 1/10 of a second and continuously generated.

Written documentation must coincide with the information on each DVD to facilitate easy retrieval of information.

Record audio in a clear, professional and concise manner at the same time as the video recording, including the same information as displayed on the screen. Provide special commentary for unusual conditions of streets, sidewalks, structures, fencing, trees and other large vegetation, surface water pathways, etc.

All DVDs and their containers must bear labels with the following information:

- a. DVD Number.
- b. Project Name and Number.
- c. Project Site.
- d. Date of Recording.
- e. Location and Standing Limit of DVD.

-- End of Section --

SECTION 01 33 00

SUBMITTAL PROCEDURES

PART 1 GENERAL

1.1 SUMMARY

The Government may request submittals in addition to those specified when deemed necessary to adequately describe the work covered in the respective sections. Each submittal must be complete and in sufficient detail to allow ready determination of compliance with contract requirements. Units of weights and measures used on all submittals must be the same as those used in the Contract Drawings.

The Contractor's Quality Control (CQC) System Manager and the Designer of Record, if applicable, must check and approve all items prior to submittal and stamp, sign, and date indicating action taken. Proposed deviations from the contract requirements must be clearly identified. Include items such as the following within submittals: Contractor's, manufacturer's, or fabricator's drawings; descriptive literature including (but not limited to) catalog cuts, diagrams, test reports; test cylinders; samples; certifications; warranties; and other such required submittals.

Submittals requiring Government approval must be scheduled and made prior to the acquisition of the material or equipment covered thereby. Pick up and dispose of samples not incorporated into the work in accordance with the manufacturer's Safety Data Sheets (SDS) and in compliance with existing laws and regulations.

1.2 DEFINITIONS

1.2.1 Submittal Descriptions (SD)

Submittal requirements are specified in the technical sections. Submittals are identified by Submittal Description (SD) numbers and titles as follows:

SD-01 Preconstruction Submittals

Pre-construction submittals are required prior to commencing work on site, or the start of the next major phase of the construction on a multiphase contract. Preconstruction Submittals include schedules and a tabular list of locations, features, and other pertinent information regarding products, materials, equipment, or components to be used in the work.

SD-02 Shop Drawings

Drawings, diagrams, and schedules specifically prepared to illustrate some portion of the work. Diagrams and instructions from a manufacturer or fabricator for use in producing the product and as aids to the Contractor for integrating the product or system into the project.

Drawings prepared by or for the Contractor to show how multiple systems and interdisciplinary work must be coordinated.

SD-03 Product Data

Catalog cuts, illustrations, schedules, diagrams, performance charts, instructions and brochures illustrating size, physical appearance and other characteristics of materials or equipment for some portion of the work. Samples of warranty language when the contract requires extended product use.

SD-04 Samples

Physical examples of materials, equipment, or workmanship that illustrate functional and aesthetic characteristics of a material or product and establish standards by which the work can be judged. Color samples from the manufacturer's standard line (or custom color samples if specified) to be used in selecting or approving colors for the project. Field samples and mock-ups constructed on the project site establish standards by which the work can be judged. Includes assemblies or portions of assemblies which are to be incorporated into the project and those which will be removed at conclusion of the work.

SD-05 Design Data

Design calculations, mix designs, analyses or other data pertaining to a part of work.

SD-06 Test Reports

Reports signed by an authorized official of a testing laboratory that a material, product or system identical to the material, product or system to be provided has been tested in accordance with specified requirements. Unless specified in another section, testing must have been within three years of date of contract award for the project.

Reports that includes findings of a test required to be performed by the Contractor on an actual portion of the work or prototype prepared for the project before shipment to the job site. Report which includes findings of a test made at the job site or on a sample taken from the job site, on a portion of work during or after installation. Report also includes the following: investigation reports, daily checklists, final acceptance tests, and operational reports.

SD-07 Certificates

Statements signed by responsible officials of the manufacturer of a product, system or material attesting that the product, system or material meets the specification requirements. Must be dated after award of project contract and clearly name the project. Document required of the Contractor, or of a supplier, installer or subcontractor through the Contractor, the purpose of which is to further the quality of orderly progression of a portion of the work by documenting procedures, acceptability of methods or personnel qualifications.

SD-08 Manufacturer's Instructions

Preprinted material describing installation of a product, system or material, including special notices and SDSs concerning impedances, hazards, and safety precautions.

SD-09 Manufacturer's Field Reports

Documentation of the testing and verification actions taken by the manufacturer's representative at the job site, in the vicinity of the job site, or on a sample taken from the job site, on a portion of the work, during or after installation, to confirm compliance with manufacturer's standards or instructions. The documentation must be signed by an authorized official of a testing laboratory or agency, must state the test results, and indicate whether the material, product, or system has passed or failed the test.

SD-10 Operation and Maintenance Data

Data provided by the manufacturer, or the system provider, including manufacturer's help and product line documentation, necessary to maintain and install equipment, for operating and maintenance use by facility personnel. Data required by operating and maintenance personnel for the safe and efficient operation, maintenance and repair of the item. Data incorporated in an operations and maintenance manual or control system.

SD-11 Closeout Submittals

Documentation to record compliance with technical or administrative requirements or to establish an administrative mechanism. Special requirements necessary to properly close out a construction contract. For example, Record Drawings and as-built drawings. Also, submittal requirements necessary to properly close out a major phase of construction on a multi-phase contract.

1.2.2 Work

As used in this section, on-site and off-site construction required by Contract Documents, including labor necessary to produce submittals, construction, materials, products, equipment, and systems incorporated or to be incorporated in such construction. In exception, excludes work to produce SD-01 submittals.

1.2.3 Approving Authority

Office or designated person authorized to approve the submittal.

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals with an "FIO" designation are for information only. Submit the following to the Government in accordance with this section.

SD-01 Preconstruction Submittals

Submittal Register; G

Prepare, maintain, and submit the Submittal Register as detailed in Paragraph 1.9 herein.

1.4 SUBMITTAL CLASSIFICATION

Submittals are classified as follows:

1.4.1 Government Approved (G)

Governmental approval is required for extensions of design, critical materials, deviations, equipment whose compatibility with the entire system must be checked, and other items as designated by the Government. Within the terms of the Contract Clause SPECIFICATIONS AND DRAWINGS FOR CONSTRUCTION, they are considered "shop drawings."

1.4.2 For Information Only (FIO)

Submittals not requiring Government approval are for information only. Within the terms of the Contract Clause SPECIFICATIONS AND DRAWINGS FOR CONSTRUCTION, they are not considered to be "shop drawings."

1.5 PREPARATION

1.5.1 Transmittal Form

Use the ENG Form 4025-R transmittal form attachment for submitting both Government-approved and information-only submittals. Submit in accordance with the instructions on the reverse side of the form. These forms or similar forms are included in the Resident Management System Contractor Mode (RMS CM) software that the Contractor is required to use for this contract. Properly complete this form by filling out all the heading blank spaces and identifying each item submitted. Exercise special care to ensure proper listing of the specification paragraph and sheet number of the Contract Drawings pertinent to the data submitted for each item.

1.5.2 Identifying Submittals

When submittals are provided by a subcontractor, the RA Contractor must prepare, review, and stamp all specified submittals prior to submitting for Government approval.

Identify submittals, except sample installations and sample panels, with the following information permanently adhered to or noted on each separate component of each submittal and noted on each transmittal form. Mark each copy of each submittal identically, with the following:

- a. Project title and location.
- b. Construction contract number.
- c. Date of the drawings and revisions.
- d. Name, address, and telephone number of subcontractor, supplier, manufacturer and any other subcontractor associated with the submittal.
- e. Specification section number by which submittal is required.
- f. SD number of each component of submittal.
- g. When a resubmission, add alphabetic suffix to the submittal description; for example, submittal 18 would become 18A to indicate resubmission.
- h. Product identification and location in project.

1.5.3 Submittal Format

1.5.3.1 Format of SD-01 Preconstruction Submittals

When the submittal includes a document that is to be used in the project, or is to become part of the project record, other than as a submittal, the Contractor's approval stamp must not be applied to the document itself, but to a separate sheet accompanying the document.

Data must be provided in the unit of measure used in the Contract Documents.

1.5.3.2 Format for SD-02 Shop Drawings

Provide shop drawings not less than 8-½ by 11 inches nor larger than 30 by 42 inches in size, except for full-size patterns or templates. Drawings must be prepared to accurate size, with scale indicated, unless another form is required. Drawings must be suitable for reproduction and of a quality to produce clear, distinct lines and letters with dark lines on a white background.

Include the following information on the shop drawing clearly marked thereon:

- a. Job name, which must be the general title of the Contract Drawings.
- b. Date of the drawings and revisions.
- c. Name of Contractor.
- d. Name of subcontractor.
- e. Name of the item, material, or equipment detailed thereon.
- f. Submittal number (e.g., first submittal to last submittal) in a uniform location adjacent to the title block.
- g. Specification section to which the submittal applies.
- h. Government contract number in the margin, immediately below the title block.

Drawings must include dimensions, except diagrams and schematic drawings. Drawings should demonstrate interface with other trades to scale. The same unit of measure for shop drawings must be used as indicated on the Contract Drawings. Materials and products must be identified for work shown.

Drawings must be numbered in a logical sequence. The Contractor may use their own number system.

A blank space, no smaller than a 4-inch square, must be reserved on the right hand side of each sheet for the Government disposition stamp.

1.5.3.3 Format of SD-03 Product Data

Present product data submittals for each section as a complete, bound volume. Include table of contents, listing page and catalog item numbers for product data. Indicate, by prominent notation, each product which is

being submitted; indicate specification section number and paragraph number to which it pertains.

Supplement product data with material prepared for the project to satisfy submittal requirements for which product data do not exist. Identify this material as developed specifically for the project, with information and format as required for submission of SD-07 Certificates.

Include the manufacturer's name, trade name, place of manufacture, and catalog model or number on product data. Also include applicable federal, military, industry and technical society publication references. Should manufacturer's data require supplemental information for clarification, submit as specified for SD-07 Certificates.

Where equipment or materials are specified to conform to industry and technical society reference standards of organizations such as the American National Standards Institute (ANSI), ASTM International (ASTM), National Electrical Manufacturer's Association (NEMA), Underwriters Laboratories (UL), and Association of Edison Illuminating Companies (AEIC), submit proof of such compliance. The label or listing by the specified organization is acceptable evidence of compliance. In lieu of the label or listing, submit a certificate from an independent testing organization, competent to perform testing and approved by the Government. State on the certificate that the item has been tested in accordance with the specified organization's test methods and that the item complies with the specified organization's reference standard.

Collect required data submittals for each specific material, product, unit of work, or system into a single submittal marked for choices, options, and portions applicable to the submittal. Mark each copy of the product data identically. Partial submittals will not be accepted for expedition of the construction effort.

1.5.3.4 Format of SD-04 Samples

Samples must be physically identical to the proposed material or product to be incorporated in the work, fully fabricated and finished in the specified manner, and full-scale. Where variations in color, finish, pattern, or texture are inherent in the material or product represented by the sample, multiple units of the sample, showing the near limits of the variations and the "average" of the whole range (not less than three), must be submitted. Each unit must be marked to describe its relation to the range of the variation. Where samples are specified for selection of color, finish, pattern, or texture, the full set of available choices must be submitted for the material or product specified. Sizes and quantities of samples must represent their respective standard unit.

1.5.3.5 Format of SD-05 Design Data

Provide design data and certificates in a digital file format approved by the Contracting Officer sized for 8-1/2 by 11-inch paper.

1.5.3.6 Format of SD-06 Test Reports

By prominent notation, indicate each report in the submittal. Indicate the specification number and paragraph number to which each report pertains.

1.5.3.7 Format of SD-07 Certificates

Provide design data and certificates in a digital file format approved by the Contracting Officer sized for 8-1/2 by 11-inch paper.

1.5.3.8 Format of SD-08 Manufacturer's Instructions

Present manufacturer's instructions submittals for each section as a complete, bound volume. Include the manufacturer's name, trade name, place of manufacture, and catalog model or number on product data. Also include applicable federal, military, industry, and technical-society publication references. If supplemental information is needed to clarify the manufacturer's data, submit it as specified for SD-07 Certificates.

Submit the manufacturer's instructions before installation.

1.5.3.9 Format of SD-09 Manufacturer's Field Reports

By prominent notation, indicate each report in the submittal. Indicate the specification number and paragraph number to which each report pertains.

1.5.3.10 Format of SD-11 Closeout Submittals

When the submittal includes a document that is to be used in the project or is to become part of the project record, other than as a submittal, do not apply the Contractor's approval stamp to the document itself, but to a separate sheet accompanying the document.

Provide data in the unit of measure used in the contract documents.

1.6 VARIATIONS

Variations from contract requirements require Contracting Officer approval and must be considered where advantageous to the Government.

1.6.1 Considering Variations

Discussion of variations with the Contracting Officer before submission of a variation submittal will help ensure that functional and quality requirements are met and minimize rejections and resubmittals. For variations that include design changes or some material or product substitutions, the Government may require an evaluation and analysis by a licensed professional engineer hired by the Contractor. The Professional Engineer Certification Form is included as an attachment.

Variations from contract requirements must be specifically pointed out in a variation submittal delivered to the Contracting Officer. Failure to point out variations may cause the Government to require rejection and removal of such work. The variation submittal must include documentation illustrating the nature and features of the variation including any necessary technical submittals and why the variation is desirable and beneficial to the Government.

The Contracting Officer will indicate an approval or disapproval of the variation request; and if not approved as submitted, will indicate the Government's reasons. Any work done before such approval is received is performed at the Contractor's risk.

1.6.2 Warranting that Variations are Compatible

When delivering a variation for approval, the Contractor warrants that this contract has been reviewed to establish that the variation, if incorporated, must be compatible with other elements of work.

1.6.3 Review Schedule Extension

In addition to the normal submittal review period, a period of 14 calendar days will be allowed for the Government to consider the submittal with variations.

1.7 APPROVED SUBMITTALS

The Government's approval of submittals must not be construed as a complete check but will indicate only that the general method of construction, materials, detailing and other information are satisfactory.

Approval or acceptance by the Government for a submittal does not relieve the Contractor of the responsibility for meeting the contract requirements or for any error that may exist, because under the QC requirements of this contract, the Contractor is responsible for ensuring information contained within each submittal accurately conforms with the requirements of the Contract Documents.

After submittals have been approved or accepted by the Government, no resubmittal for the purpose of substituting materials or equipment will be considered unless accompanied by an explanation of why a substitution is necessary.

1.8 DISAPPROVED SUBMITTALS

Make corrections required by the Contracting Officer. If the Contractor considers any correction or notation on the returned submittals to constitute a change to the Contract Drawings or Specifications, give notice to the Contracting Officer. The Contractor is responsible for the dimensions and design of connection details and the construction of work. Failure to point out variations may cause the Government to require rejection and removal of such work.

If changes are necessary to submittals, make such revisions and resubmit in accordance with the procedures above. No item of work requiring a submittal change is to be accomplished until the changed submittals are approved.

1.9 PROJECT SUBMITTAL REGISTER

A sample Project Submittal Register listing work plans and items of equipment and materials for when submittals are required by the specifications is provided as "Appendix A - Submittal Register." This list may not be all-inclusive and additional submittals may be required.

Maintain a submittal register for the project.

1.9.1 Submittal Management

Prepare and maintain a submittal register, as the work progresses. Use an electronic submittal register program furnished by the Government. Do not change data that is output in columns (c), (d), (e), and (f) as delivered

by Government; retain data that is output in columns (a), (g), (h), and (i) as approved. As an attachment, provide a submittal register showing items of equipment and materials for which submittals are required by the specifications. This list may not be all-inclusive and additional submittals may be required. Maintain a submittal register for the project in accordance with SECTION 01 45 00.15 - RESIDENT MANAGEMENT SYSTEM CONTRACTOR MODE (RMS CM).

The Contractor is to track all submittals by maintaining a complete list, including completion of all data columns and all dates on which submittals are received by and returned by the Government.

1.9.2 Preconstruction Use of Submittal Register

Submit the submittal register as an electronic database, using the submittal management program furnished to Contractor. Include the QC plan and the project schedule. Verify that all submittals required for the project are listed and add missing submittals. Coordinate and complete the following fields on the register database submitted with the QC plan and the project schedule:

Column (a) Activity Number: Activity number from the project schedule.

Column (g) Contractor Submit Date: Scheduled date for the approving authority to receive submittals.

Column (h) Contractor Approval Date: Date that Contractor needs approval of submittal.

Column (i) Contractor Material: Date that Contractor needs material delivered to Contractor control.

1.9.3 Contractor Use of Submittal Register

Update the following fields in the Government-furnished submittal register program with each submittal throughout the contract.

Column (b) Transmittal Number: List of consecutive, Contractor-assigned numbers.

Column (j) Action Code (k): Date of action used to record Contractor's review when forwarding submittals to QC.

Column (l) Date submittal transmitted.

Column (q) Date approval was received.

1.10 SCHEDULING

Submittals covering component items forming a system or items that are interrelated must be scheduled to be submitted concurrently. Certifications to be submitted with the pertinent drawings must be so scheduled. Adequate time (a minimum of 21 calendar days exclusive of mailing time) must be allowed and shown on the register for review and approval.

The Government will review the submittal register for approval action. The Contractor is responsible for additional time required for Government

reviews resulting from required resubmittals. The review period for each resubmittal is the same as for the initial submittal. The Contractor is responsible for coordinating scheduling, sequencing, preparing, and processing submittals with performance of work so that work will not be delayed by submittal processing.

The approved register will become a part of the contract and the Contractor is subject to the requirements thereof. Revise and/or update the register monthly to consider all changes in the contract. Each such addition and/or revision to the register must be submitted to the Government for approval. This register and the progress schedules must be coordinated.

1.11 SUBMITTAL PROCEDURES

Submittals must be made as follows:

1.11.1 Procedures

Submit an electronic copy of the transmittal to the Government in accordance with the submittal register. Obtain the email address list or other method of electronic submittal from the Contracting Officer at the Pre-Construction Conference.

1.11.2 Deviations

For submittals that include proposed deviations requested by the Contractor, the column "Variation" of ENG Form 4025-R must be checked. Set forth in writing the reason for any deviations and annotate such deviations on the submittal. The Government reserves the right to rescind approval of submittals containing unnoted deviations.

1.12 CONTROL OF SUBMITTALS

Carefully control procurement operations to ensure that each individual submittal is made on or before the Contractor-scheduled submittal date shown on the approved submittal register.

1.13 GOVERNMENT APPROVED SUBMITTALS

Upon completion of review of submittals requiring Government approval, the Contractor will receive, in writing, the approval or required resubmission with an approval code listed in Paragraph 1.19.1.

1.14 INFORMATION ONLY SUBMITTALS

Submittals without a "G" designation must be certified by the QCM and submitted to the Contracting Officer for information only. Approval of the Contracting Officer is not required on information only submittals. The Contracting Officer will mark "receipt acknowledged" on submittals for information and will return only the transmittal cover sheet to the Contractor. Normally, submittals for information only will not be returned. However, the Government reserves the right to return unsatisfactory submittals and require the Contractor to resubmit any item found not to comply with the contract. This does not relieve the Contractor from the obligation to furnish material conforming to the plans and specifications; will not prevent the Contracting Officer from requiring removal and replacement of nonconforming material incorporated in the work; and does not relieve the Contractor of the requirement to

furnish samples for testing by the Government laboratory or for check testing by the Government in those instances where the technical specifications so prescribe.

1.15 STAMPS

Stamps used by the Contractor on the submittal data to certify that the submittal meets contract requirements must be similar to the following

CONTRACTOR (FIRM NAME)
____ Approved
____ Approved with corrections as noted on submittal data and/or attached sheet(s).
SIGNATURE: _____
TITLE: _____
DATE: _____

1.16 RESUBMISSION REQUIREMENTS

Resubmission requirements must include the following:

- a. Make any corrections or changes to the submittals required by the Government and resubmit until approved.
- b. Revise initial drawings or data and resubmit as specified for the initial submittal.
- c. Indicate any changes that have been made other than those requested by the Government.

1.17 CONTRACTOR'S RESPONSIBILITIES

Review shop drawings, product data and samples prior to submission to determine and verify the following:

- a. Field measurements
- b. Field construction criteria

The review and approval of shop drawings or samples by the Government will not relieve the Contractor from its responsibility with regard to the fulfillment of the terms of the contract. The Contractor assumes all risks of error and omission, and the Government will have no responsibility thereof.

No portion of the work requiring shop drawings, working drawings, samples,

or catalog data may be started nor must any materials be fabricated, installed, or used on the Site prior to Government approval.

Project work, materials, fabrication and installation must conform to approved shop drawings, working drawings, applicable samples, and catalog data.

1.18 PROFESSIONAL ENGINEER (P.E.) CERTIFICATION FORM

If specifically required in other sections of these specifications, submit a P.E. Certification for each item required, in the form attached to this Section, completely filled in and stamped.

1.19 GOVERNMENT'S REVIEW

1.19.1 Review Notations

The Government will review submittals and provide pertinent notation within 21 calendar days after date of submission. Submittals must be returned to the Contractor with the following notations:

- a. Submittals marked "A - Approved or accepted as submitted" authorize the Contractor to proceed with the work covered.
- b. Submittals marked "B - Approved as noted or Approved, except as noted" authorize the Contractor to proceed with the work covered provided that the Contractor takes no exception to the corrections. Notes must be incorporated prior to submission of the final submittal.
- c. Submittals marked "C - Resubmission required" require the Contractor to make the necessary corrections and revisions and to re-submit them for approval in the same routine as before, prior to proceeding with any of the work depicted by the submittal.
- d. Submittals marked "D" must be returned to the Contractor by separate correspondence.
- e. Submittals marked "E - Not approved or Disapproved", or "X - Receipt acknowledged, does not comply" indicate noncompliance with the contract requirements and must be re-submitted with appropriate changes. No item requiring a submittal may be accomplished until the submittals are approved or approved as noted.
- f. Submittals marked "F - Receipt acknowledged" meet submittal requirements "for information only".
- g. Submittals marked "G - Other action required" require the Contractor to take additional action, as specified by the Government, before the submittal is approved. Take the necessary action and re-submit the item for approval.

1.19.2 Corrections

Make corrections required by the Government. If the Contractor considers any correction or notation on the returned submittals to constitute a change to the Contract Drawings or Specifications, notice as required under the Contract Clause entitled "Changes" must be given to the Government. Approval of the submittals by the Government should not be construed as a complete check but will indicate only that the general

method of construction and detailing is satisfactory. The Contractor is responsible for the dimensions and design of connection details and construction of work. Failure to point out deviations may result in the Government requiring rejection and removal of such work.

1.19.3 Resubmittals

If changes are necessary to approved submittals, make such revisions and resubmit the submittals in accordance with the procedures above. No item of work requiring a submittal change may be accomplished until the changed submittals are approved.

1.19.4 Sample Approval

Furnish, for the approval of the Government, samples required by the specifications or by the Government. Shipping charges must be paid by the Contractor. Materials or equipment requiring sample approval must not be delivered to the Site or used in the work until approved in writing by the Government.

Each sample must have a label indicating:

- a. Name of project
- b. Name of Contractor
- c. Material or equipment
- d. Place of origin
- e. Name of producer and brand
- f. Specification section to which sample applies
- g. Samples of furnished material must have additional markings that will identify them under the finished schedules

Submit to the Government two samples of materials where samples are requested. Transmit to the Government with each sample a letter, original and two copies, containing the above information.

Approval of a sample must be only for the characteristics or use named in such approval and must not be construed to change or modify any contract requirements. Before submitting samples, ensure that the materials or equipment are available in quantities required in the project. No change or substitution is permitted after a sample has been approved.

Materials and equipment incorporated in the work must match the approved samples. If requested, approved samples, including those which may be damaged in testing, will be returned to the Contractor upon completion of the contract. Samples not approved will also be returned to the Contractor if requested.

Failure of any materials to pass the specified tests is sufficient cause for refusal to consider, under this contract, any further samples of the same brand or make of that material. The Government reserves the right to disapprove any material or equipment which previously has proved unsatisfactory in service.

White Chemical Corporation Superfund Site, OU3
Final 100% Remedial Design

Variations from contract requirements must be specifically pointed out in transmittal letters. Failure to point out deviations may result in the Government requiring rejection and removal of such work.

Samples of various materials or equipment delivered on the Site or in place may be taken by the Government for testing. Samples failing to meet contract requirements will automatically void previous approvals. Replace such materials or equipment to meet contract requirements.

Approval of the Contractor's samples by the Government must not relieve the Contractor of his responsibilities under the Contract.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

-- End of Section --

INSTRUCTIONS

1. Section I will be initiated by the Contractor in the required number of copies.
2. Each Transmittal shall be numbered consecutively. The Transmittal Number typically includes two parts separated by a dash (-). The first part is the specification section number. The second part is a sequential number for the submittals under that spec section. If the Transmittal is a resubmittal, then add a decimal point to the end of the original Transmittal Number and begin numbering the resubmittal packages sequentially after the decimal.
3. The "Item No." for each entry on this form will be the same "Item No." as indicated on ENG FORM 4288-R.
4. Submittals requiring expeditious handling will be submitted on a separate ENG Form 4025-R.
5. Items transmitted on each transmittal form will be from the same specification section. Do not combine submittal information from different specification sections in a single transmittal.
6. If the data submitted are intentionally in variance with the contract requirements, indicate a variation in column h, and enter a statement in the Remarks block describing the detailed reason for the variation.
7. ENG Form 4025-R is self-transmitting - a letter of transmittal is not required.
8. When submittal items are transmitted, indicate the "Submittal Type" (SD-01 through SD-11) in column c of Section I.
Submittal types are the following:

SD-01 - Preconstruction	SD-02 - Shop Drawings	SD-03 - Product Data	SD-04 - Samples	SD-05 - Design Data	SD-06 - Test Reports
SD-07 - Certificates	SD-08 - Manufacturer's Instructions	SD-09 - Manufacturer's Field Reports	SD-10 - O&M Data	SD-11 - Closeout	
9. For each submittal item, the Contractor will assign Submittal Action Codes in column g of Section I. The U.S. Army Corps of Engineers approving authority will assign Submittal Action Codes in column i of Section I. The Submittal Action Codes are:

A -- Approved as submitted.	F -- Receipt acknowledged.
B -- Approved, except as noted on drawings. Resubmission not required.	X -- Receipt acknowledged, does not comply with contract requirements, as noted.
C -- Approved, except as noted on drawings. Refer to attached comments. Resubmission required.	G -- Other action required (Specify)
D -- Will be returned by separate correspondence.	K -- Government concurs with intermediate design. (For D-B contracts)
E -- Disapproved. Refer to attached comments.	R -- Design submittal is acceptable for release for construction. (For D-B contracts)
10. Approval of items does not relieve the contractor from complying with all the requirements of the contract.

P. E. CERTIFICATION FORM

The undersigned hereby certifies that he/she is a Professional Engineer registered in the State
of New Jersey and that he/she has been employed by

_____ to design _____
(Name of Contractor) (Insert P.E. Responsibilities)

in accordance with Specification Section _____

for the

White Chemical Corporation Superfund Site, OU3
(Name of Project)

The undersigned further certifies that he/she has performed the design of the

(Component Designed)

that said design is in conformance with all applicable local, State, and Federal codes, rules, and regulations, and that his/her signature and P.E. stamp have been affixed to all calculations and drawings used in, and resulting from, the design.

The undersigned hereby agrees to make all original design drawings and calculations available to the Government within seven days following written request by the Government.

_____ P.E. Name

_____ Signature

_____ Address

_____ Contractor's Name

_____ Signature

_____ Title

_____ Address

SUBMITTAL REGISTER

CONTRACT NO.

TITLE AND LOCATION

White Chemical OU3 RD Redesign

CONTRACTOR

ACTIVITY NO	TRANSMITTAL NO	SPEC SECT	DESCRIPTION ITEM SUBMITTED	PARAGRAPH #	GOVT CLASS SIF CATION REVIEW WR	CONTRACTOR: SCHEDULE DATES			CONTRACTOR ACTION		DATE FWD TO APPR AUTH/ DATE RCD FROM CONTR	APPROVING AUTHORITY				MAILED TO CONTR/ DATE RCD FRM APPR AUTH	REMARKS
						SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION		DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER	ACTION CODE	DATE OF ACTION		
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)
		01 30 00	SD-01 Preconstruction Submittals														
			Project Organizational Chart		G												
			Project Manager Name and Experience		G												
			Data Retrieval Recordkeeping System		G												
			View Location Map														
			SD-03 Product Data														
			Conference Meeting Minutes		G												
			Project Progress Meeting Minutes		G												
			SD-11 Closeout Submittals														
			Pre-Construction and Post-Construction Project Photographs														
			Progress Project Photographs														
		01 32 01.00 10	SD-01 Preconstruction Submittals														
			Project Scheduler Qualifications		G												
			Preliminary Project Schedule		G												
			Initial Project Schedule		G												
			SD-03 Product Data														
			Periodic Schedule Update		G												
		01 32 36	SD-11 Closeout Submittals														
			Pre-Construction, Progress, and Post-Construction Video														
		01 33 00	SD-01 Preconstruction Submittals														
			Submittal Register		G												

SUBMITTAL REGISTER

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TITLE AND LOCATION

White Chemical OU3 RD Redesign

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						SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE RCD FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER	ACTION CODE	DATE OF ACTION		
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)
		01 33 29	SD-01 Preconstruction Submittals														
			Sustainability Action Plan		G												
			SD-03 Product Data														
			Renewable Energy Program		G												
			Fuel		G												
			Paper Product Literature		G												
			Recycling Facilities														
			SD-07 Certificates														
			Green Remediation														
			Documentation														
		01 35 29	SD-01 Preconstruction Submittals														
			Accident Prevention Plan/Site		G												
			Safety and Health Plan														
			(APP/SSHP)														
			SD-02 Shop Drawings														
			Work Zone and Decontamination		G												
			Facility Drawings														
			SD-03 Product Data														
			Weekly Safety and Mishap														
			Notification and Investigation														
			Reports														
			Activity Hazard Analysis		G												
			Exposure and Air Monitoring Data														
			SD-07 Certificates														
			Personnel Health and Safety														
			Certificates														

CONTRACT NO.

CONTRACTOR

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SUBMITTAL REGISTER

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TITLE AND LOCATION

White Chemical OU3 RD Redesign

CONTRACTOR

ACTIVITY NO	TRANSMITTAL NO	SPEC SECT	DESCRIPTION ITEM SUBMITTED	PARAGRAPH	GOVT CLASSIFICATION	CONTRACTOR: SCHEDULE DATES			CONTRACTOR ACTION		DATE FWD TO APPR AUTH/	APPROVING AUTHORITY				MAILED TO CONTR/	REMARKS
						SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE RCD FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER	ACTION CODE	DATE OF ACTION	DATE RCD FRM APPR AUTH	
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)
		01 50 00	Contractor Temporary Network Cybersecurity Compliance Statements		G												
			Permit Equivalencies and Approvals														
		01 57 19	SD-01 Preconstruction Submittals														
			Preconstruction Survey														
			Regulatory Notifications		G												
			Environmental Protection Plan		G												
			Employee Training Records		G												
			Environmental Manager Qualifications		G												
			Solid Waste Management Permit		G												
			SD-06 Test Reports														
			Monthly Solid Waste Disposal Report		G												
			SD-11 Closeout Submittals														
			Assembled Employee Training Records		G												
			Regulatory Notifications		G												
			Contractor Certification														
		01 71 23	SD-01 Preconstruction Submittals														
			Initial Survey Map		G												
			SD-03 Product Data														
			Surveyor Qualifications														
			Survey Accuracy Documentation														

SUBMITTAL REGISTER

CONTRACT NO.

TITLE AND LOCATION

White Chemical OU3 RD Redesign

CONTRACTOR

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						SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE RCD FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER	ACTION CODE	DATE OF ACTION	DATE RCD FRM APPR AUTH	
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)
		01 71 23	Surveyor Field Notes														
			Survey Quantities														
			SD-07 Certificates														
			Well Certification														
			SD-11 Closeout Submittals														
			Survey Points														
		01 78 00	SD-11 Closeout Submittals														
			Construction Narrative Report and Data		G												
			As-Built Drawings		G												
			Redline Documents		G												
		01 80 00	SD-06 Test Reports														
			Preliminary Data Submittal		G												
			Validated Data Submission		G												
			Synoptic Water Level Measurements		G												
		01 85 10	SD-01 Preconstruction Submittals														
			Well Maintenance Work Plan		G												
			SD-03 Product Data														
			Chemical Data Sheet		G												
			SD-05 Design Data														
			Well Maintenance Record/Log		G												
		02 10 00	SD-01 Preconstruction Submittals														
			Site Preparation Plan		G												
			Utility Survey		G												
			SD-04 Samples														

SUBMITTAL REGISTER

CONTRACT NO.

TITLE AND LOCATION

White Chemical OU3 RD Redesign

CONTRACTOR

ACTIVITY NO	TRANSMITTAL NO	SPEC SECT	DESCRIPTION ITEM SUBMITTED	PARAGRAPH #	GOVT CLASS S I F I C A T I O N O R A / E R E V I O W R	CONTRACTOR: SCHEDULE DATES			CONTRACTOR ACTION		DATE FWD TO APPR AUTH/ DATE RCD FROM CONTR	APPROVING AUTHORITY				MAILED TO CONTR/ DATE RCD FRM APPR AUTH	REMARKS
						SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION		DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER	ACTION CODE	DATE OF ACTION		
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)
		02 10 00	Proposed Aggregate Samples		G												
			SD-06 Test Reports														
			Laboratory Results		G												
			SD-07 Certificates														
			Permits														
			Aggregate sources and certification		G												
		02 32 13	SD-01 Preconstruction Submittals														
			Permits		G												
			SD-06 Test Reports														
			Preliminary VOC Results		G												
			Validated VOC Results		G												
			Boring Coordinates														
		02 81 00	SD-01 Preconstruction Submittals														
			Waste Management and Transportation Plan		G												
			SD-03 Product Data														
			Notices of Non-Compliance and Notices of Violation		G												
			Contaminated Material Stockpile Reports		G												
			SD-06 Test Reports														
			Spill Response		G												
			Recordkeeping		G												
			Exception Report		G												
			SD-07 Certificates														

SUBMITTAL REGISTER

CONTRACT NO.

TITLE AND LOCATION

White Chemical OU3 RD Redesign

CONTRACTOR

ACTIVITY NO	TRANSMITTAL NO	SPEC SECT	DESCRIPTION ITEM SUBMITTED	PARAGRAPH	GOVT CLASSIFICATION	CONTRACTOR: SCHEDULE DATES			CONTRACTOR ACTION		DATE FWD TO APPR AUTH/	APPROVING AUTHORITY				MAILED TO CONTR/	REMARKS
						SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE RCD FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER	ACTION CODE	DATE OF ACTION	DATE RCD FRM APPR AUTH	
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)
		02 81 00	Transportation and Disposal		G												
			Coordinator Qualifications														
			EPA Off-Site Policy		G												
			Certification		G												
			Training		G												
			Transportation Certification														
			Certificates of Disposal		G												
			Shipping Documents		G												
		13 30 00	SD-01 Preconstruction Submittals														
			Amendment Injection Work Plan		G												
			SD-03 Product Data														
			Amendment Data Sheet		G												
			SD-11 Closeout Submittals														
			Amendment Injection Record		G												
		32 01 13	SD-03 Product Data														
			Mix Designs		G												
		33 51 39	SD-01 Preconstruction Submittals														
			Well Condition Assessment and		G												
			Repair Plan														
			Drilling Methods		G												
			Drilling Work Plan		G												
			Decontamination Pad Design		G												
			SD-03 Product Data														
			Catalog Data														
			Drilling Logs		G												
			Well Installation Reports														

SUBMITTAL REGISTER

CONTRACT NO.

TITLE AND LOCATION

White Chemical OU3 RD Redesign

CONTRACTOR

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SECTION 01 33 29

SUSTAINABILITY REQUIREMENTS AND REPORTING

PART 1 GENERAL

1.1 SCOPE OF WORK

Incorporate green remediation practices during construction activities whenever feasible in accordance with the EPA Region 2 "Clean & Green" Policy, updated on March 11, 2010. This section covers the requirements for performing green remediation practices at the Site, including furnishing all labor, materials, equipment and incidentals required to complete the work described herein.

1.2 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only. Where reference is made to one of these standards, the revision in effect at the time of contract award applies.

ASTM INTERNATIONAL (ASTM)

ASTM D6751-20 Biodiesel Fuel Blend Stock (B100) for
Middle Distillate Fuels

U.S. DEPARTMENT OF AGRICULTURE (USDA)

FSRIA 9002 Farm Security and Rural Investment Act
Section 9002 (USDA BioPreferred Program)

U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)

40 CFR 247 Comprehensive Procurement Guideline for
Products Containing Recovered Materials

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals with an "FIO" designation are for information only. Submit the following to the Contracting Officer in accordance with SECTION 01 33 00 - SUBMITTAL PROCEDURES.

SD-01 Preconstruction Submittals

Sustainability Action Plan; G

Submit a plan to maximize sustainability, reduce energy and water usage, promote carbon neutrality, and promote industrial materials reuse and recycling to the extent practicable.

SD-03 Product Data

Renewable Energy Program; G

Submit details regarding the renewable energy program to be used to

purchase renewable energy through the local energy supplier for all site activities, including name of the renewable energy supplier; type and percentage of renewable energy to be used (solar, wind, etc.); and method of supply (direct or Renewable Energy Certificates).

Fuel; G

Submit details regarding the fuel providers and types of fuel, including sulfur content, to be purchased during the construction activities.

Paper Product Literature; G

Submit product literature for copy papers, file folders, and other paper office supplies indicating that the supplies meet the minimum requirements for recycled content as specified herein.

Recycling Facilities

Provide recycling facility information for disposal of non-hazardous concrete and debris, including any applicable permits and licenses.

SD-07 Certificates

Green Remediation Documentation; FIO

Submit documentation to support the green remediation activities implemented, including, but not limited to the following:

- a. Receipts for energy purchased.
- b. Receipts for fuel purchased.
- c. Disposal certificates for waste sent to recycling and regeneration facilities.
- d. Receipts for paper products purchased.
- e. Manufacturers' documentation for recycled content for select products in compliance with EPA Comprehensive Procurement Guidelines 40 CFR 247.
- f. Manufacturers' documentation for bio-based products in compliance with FSRIA 9002, USDA's BioPreferred program.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.1 RENEWABLE ENERGY

Purchase 100 percent renewable energy through the local utility provider, Public Service Electric and Gas Company (PSE&G), for all electricity used during the remedial construction.

Submit receipts to document that 100 percent renewable energy was used for all electricity consumed during the remedial construction.

3.2 FUEL

In the Sustainability Action Plan, include a plan to use biodiesel meeting the **ASTM D6751-20**, to retrofit off-road construction equipment with diesel particulate filters (DPFs and pDPFs) to remove particles from the vehicle exhaust air, selective catalytic reduction (SCR), and/or to install diesel oxidation catalysts to reduce the quantities of nitrogen oxides and carbon monoxide that are emitted to the atmosphere, or to demonstrate that such retrofits are not needed (based on existing equipment controls or proposed fuels). Evaluate installing cabin heaters to avoid incentives to idle. Where use of biodiesel meeting **ASTM D6751-20** is not possible, use ultra-low sulfur diesel (ULSD) fuel during the remedial construction.

Submit receipts for all fuel purchases by the Contractor and subcontractors to document that ULSD fuel or biodiesel was consumed.

Vehicle idling will not be allowed for longer than 5 minutes during remedial construction, including, but not limited to, drill rigs and earth moving equipment.

3.3 MATERIAL REUSE, REDUCTION, AND RECYCLING

Acquire one hundred percent of the copy papers, file folders, and other paper office supplies from recycled sources. Required recovered materials content ranges must be as recommended by EPA's Comprehensive Procurement Guidelines (CPGs). Submit receipts indicating that the purchased products contain the required recycled content.

Perform all waste characterization sampling, handling, transportation, and disposal activities in accordance with SECTION **02 81 00** - TRANSPORTATION AND DISPOSAL OF WASTE MATERIAL. For all waste materials that were recycled, submit disposal certificates documenting that the waste was sent to a recycling facility.

Use local labor, when possible, to reduce fuel consumption associated with driving to the site. Locally supplied materials will be used when possible.

Make efforts to minimize spillage and maximize the amount of potable water collected from the hydrant being used for injections.

Schedule and sequence the work in a manner to minimize transportation and/or shipping fuel consumption whenever possible. This is to include consideration for sample shipments, transportation of waste material for off-site disposal, amendment delivery, and on-site handling of amendments during injections.

-- End of Section --

SECTION 01 35 29

HEALTH, SAFETY, AND EMERGENCY RESPONSE PROCEDURES

PART 1 GENERAL

1.1 SCOPE OF WORK

This section specifies the requirements for submission of the Accident Prevention Plan/Site Safety and Health Plan (APP/SSHP) as required by EM 385-1-1 for occupational and non-occupational exposure protection during the work activities including handling of contaminated materials. The requirements apply to work performed in both "contaminated" and "clean" areas. EM 385-1-1 and all updates are available for reference on the USACE website:
<http://www.publications.usace.army.mil/USACEPublications/EngineerManuals.aspx>

This section describes the responsibilities of the Contractor for safety, health, and emergency response and specifies the requirements for safety and occupational health for the protection of the Contractor and Government personnel, property, and resources. The Contracting Officer is committed to the active management of the work performed under these specifications so as to:

- a. Prevent injuries to employees or other persons;
- b. Maintain employee exposures to health hazards below the occupational limits established by the Occupational Safety and Health Administration (OSHA) and the American Conference of Governmental Industrial Hygienists (ACGIH) in TLV/BEI Guidelines;
- c. Keep the exposure of area residents to air contaminants below the established levels for general public exposure the U.S. Environmental Protection Agency (EPA), and the New Jersey Department of Environmental Protection (NJDEP); and
- d. Prevent increasing contaminant levels in soil, water, or sediment near the site.

Any disregard for the provisions of these safety and health requirements will be deemed just and sufficient cause for termination of the contract without compromise or prejudice to the rights of the Contractor.

This section specifies the requirements for safety and occupational health for the protection of the Contractor and Government personnel, property, and resources.

1.2 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only. Where reference is made to one of these standards, the revision in effect at the time of contract award applies.

AMERICAN CONFERENCE OF GOVERNMENTAL INDUSTRIAL HYGIENISTS (ACGIH)

TLV/BEI Guidelines

Threshold Limit Values for Chemical

Substances and Physical Agents and
Biological Exposure Indices

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

ANSI Z87.1	Practice for Occupational and Educational Eye and Face Protection
ANSI Z88.2	Standard Practice for Respiratory Protection
ANSI Z89.1	Industrial Head Protection
ANSI Z358.1	Emergency Eyewash and Shower Equipment
ANSI Z590.3	Prevention through Design
ANSI/ISEA 105-2016	American National Standard for Hand Protection

AMERICAN PETROLEUM INSTITUTE (API)

API RP 2219	Safe Operation of Vacuum Trucks Handling Flammable and Combustible Liquids in Petroleum Service
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ASTM INTERNATIONAL (ASTM)

ASTM D120	Standard Specification for Rubber Insulating Gloves
ASTM F2413	Standard Specification for Performance Requirements for Protective (Safety) Toe Cap Footwear

U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)

10 CFR 19	Notices, Instructions and Reports to Workers: Inspection and Investigations
29 CFR 1904	Recording and Reporting Occupational Injuries and Illnesses
29 CFR 1910	Occupational Safety and Health Standards
29 CFR 1926	Safety and Health Regulations for Construction
40 CFR 302	Designation, Reportable Quantities, and Notification
49 CFR 171	General Information, Regulations, and Definitions
49 CFR 172	Hazardous Materials Table, Special Provisions, Hazardous Materials Communications, Emergency Response Information, and Training Requirements

White Chemical Corporation Superfund Site, OU3
Final 100% Remedial Design

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY (EPA)

NAAQS National Ambient Air Quality Standards

EPA PSD Ambient Monitoring Guidelines for
Prevention of Significant Deterioration
(PSD)

ENGINEERING MANUALS (EM)

EM 385-1-1 Safety and Health Requirements Manual

ENGINEERING REGULATIONS (ER)

ER 385-1-92 Safety and Occupational Health
Requirements for Hazardous, Toxic and
Radioactive Waste (HTRW) Activities

OCCUPATIONAL SAFETY & HEALTH ADMINISTRATION (OSHA)

TED 01-00-015 OSHA Technical Manual

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 10 Standard for Portable Fire Extinguishers

NFPA 241 Standard for Safeguarding Construction,
Alteration, and Demolition Operations

NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH (NIOSH)

NIOSH Pub No. 85-115 Occupational Safety and Health Guidance
Manual for Hazardous Waste Site Activities

NIOSH NMAM NIOSH Manual of Analytical Methods

NEW JERSEY ADMINISTRATIVE CODE (N.J.A.C.)

N.J.A.C. 7:1E Rules on Discharge of Petroleum and other
Hazardous Substances

N.J.A.C. 7:26E Technical Requirements for Site Remediation

N.J.A.C. 7:26G Hazardous Waste Regulations

N.J.A.C. 7:29 Noise Control

N.J.A.C. 8:60 Health

N.J.A.C. 12:120 Labor

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals with an "FIO" designation are for information only. Submit the following to the Contracting Officer in accordance with SECTION 01 33 00 - SUBMITTAL PROCEDURES.

SD-01 Preconstruction Submittals

Accident Prevention Plan/Site Safety and Health Plan (APP/SSHP); G

Submit the APP/SSHP to the Contracting Officer at least 14 calendar days prior to the Pre-Construction Conference. Attach the SSHP to the APP as an appendix. The APP/SSHP must be approved by the Contracting Officer prior to commencement of field activities.

The APP/SSHP must address in detail the issues listed in this section under Paragraph 1.6 - ACCIDENT PREVENTION PLAN/SITE SAFETY AND HEALTH PLAN and elaborated upon in ER 385-1-92. Significant aspects of the APP/SSHP include:

- a. Exposure Monitoring and Sampling Program.
- b. Emergency Response Plan.
- c. Personal Protective Equipment (PPE) Maintenance Procedures.
- d. Respiratory Protection Program.
- e. Daily Inspection, Weekly Report, and Training Forms.
- f. Heat and Cold Stress Monitoring Program.
- g. Organizational Structure indicating personnel responsibilities.
- h. Hearing Conservation Program.
- i. Training requirements indicated in Paragraph 1.12 - TRAINING.
- j. Medical surveillance requirements indicated in Paragraph 1.14 - MEDICAL SURVEILLANCE.
- k. Hazard Communication Program.
- l. Spill and Discharge Control Procedures.
- m. Contingency procedures indicated in Paragraph 1.40 - EMERGENCY RESPONSE AND CONTINGENCY PROCEDURES.
- n. Dust Control Plan.
- o. Decontamination activities.
- p. Fire Prevention Plan
- q. Fall protection program
- r. Tree Felling/Maintenance Program

The APP/SSHP must also include the name and description of qualifications of the Contractor's Consulting Physician and the name, certification number and description of qualifications of the Contractor's Safety and Health Manager (SHM). The APP/SSHP must also include a letter from the Contractor's Consulting Physician stating they are aware of the hazards to be encountered by onsite personnel.

Work Zone and Decontamination Facility Drawings; G

Submit the drawings showing the Exclusion Zone, Contamination Reduction Zone and Support Zone boundaries and decontamination facility area for the Contracting Officer's approval prior to commencement of field activities.

SD-03 Product Data

Weekly Safety and Mishap Notification and Investigation Reports; FIO

Submit the following documents to the Contracting Officer during the course of the project site work:

- a. Weekly Safety Report (within one week)
- b. Mishap Notification and Investigation Report

Notify the USACE representative within 8 hours of the affected employee's notification to the employer and supervisor, after any Mishap (accident, incident, near miss). Include in the notification the Contractor name; contract title; type of contract; name of activity, installation or location where mishap occurred; date and time of mishap; names of personnel injured; extent of property damage, if any; extent of injury, if known; and brief description of mishap (to include type of construction equipment used, PPE used, etc.), cause and training history related to the work. Preserve the conditions and evidence on the mishap location until the Government investigation team arrives onsite and Government investigation is conducted.

- c. Mishap Notification and Investigation Report

In addition to mishap notification within 8-hours of each occurrence, the following mishaps also require the Prime Contractor to conduct a mishap investigation to establish the root cause(s) of the mishap, complete the USACE Mishap Notification and Investigation Report Form 3394 and provide the report to the Contracting Officer within 7 calendar days of the mishap: property damage of \$5,000 to 500,000, one or more days away from work, medical treatment greater than first aid, restricted work, hearing loss, uncontrolled release of hazardous energy (includes electrical and non-electrical), load handling equipment or rigging; fall-from-height. The Contracting Officer will provide copies of any required or special forms.

Activity Hazard Analysis; G

Submit an Activity Hazard Analysis (AHA) for each major phase of work.

Exposure and Air Monitoring Data; FIO

Submit the Exposure and Air Monitoring Data required by this section.

SD-07 Certificates

Personnel Health and Safety Certificates; FIO

Submit the following information to the Contracting Officer for approval at or prior to the Pre-Construction Conference:

- a. Initial medical certifications for all field personnel.
- b. A statement of the number of the Contractor's employees and training certificates for all field personnel who have completed the safety and health course required by 29 CFR 1910.120.
- c. Respirator fit test certificates for all field personnel.

Certificate of Worker/Visitor Acknowledgement; FIO

Submit a Certificate of Worker/Visitor Acknowledgement for each worker or visitor onsite in accordance with the requirements of this section.

SD-11 Closeout Submittals

Project Safety and Health Phase-Out Report; FIO

Submit the Project Safety and Health Phase-Out Report signed by the project SHM to the Contracting Officer after completing project site work. The report must conform to the requirements of Paragraph 1.43 - SAFETY AND HEALTH PHASE-OUT REPORT.

1.4 REGULATORY REQUIREMENTS

Work performed under this contract must comply with EM 385-1-1, OSHA requirements in 29 CFR 1910 and 29 CFR 1926, especially OSHA's Standards 29 CFR 1926.65 and 29 CFR 1910.120, state-specific requirements in N.J.A.C. 7:1E, N.J.A.C. 7:26E, N.J.A.C. 7:26G, N.J.A.C. 7:29, N.J.A.C. 8:60, N.J.A.C. 12:120, and all applicable Federal, State, and local safety and occupational health laws and regulations. This includes, but is not limited to:

OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA) STANDARDS

29 CFR 1910	Section 120	"Hazardous Waste Site Operations and Emergency Response"
	Section 1000	"Air Contaminants"
	Section 38	"Employee Emergency Plans and Fire Prevention Plans"
	Section 95	"Noise"
	Section 132	"General Requirements"
	Section 133	"Eye and Face Protection"
	Section 134	"Respiratory Protection"
	Section 135	"Head Protection"
	Section 136	"Foot Protection"
	Section 137	"Electrical Protective Equipment"

	Section 146	"Permit Required Confined Spaces"
	Section 147	"The Control of Hazardous Energy"
	Subpart L	"Fire Protection"
29 CFR 1926	Section 21	"Safety Training and Education"
	Section 52	"Occupational noise exposure"
	Section 59	"Hazard Communication"
	Section 65	"Hazardous Waste Site Operations and Emergency Response"
	Section 602	"Material Handling Equipment"
	Subpart E	"Personal Protective and Life Saving Equipment"
	Subpart F	"Fire Protection and Prevention"
	Subpart G	"Signs, Signals, and Barricades"
	Subpart M	"Fall Protection"
10 CFR 19		"Notices, Instructions, and Reports to Workers: Inspections and Investigations"

Submit matters of interpretation of standards to the Contracting Officer or appropriate administrative agency for resolution before starting work. Where the requirements of this specification, applicable laws, criteria, ordinances, regulations, and referenced documents vary, the most stringent requirements apply.

1.5 MEETINGS

1.5.1 Pre-Construction Safety Conference

A pre-construction safety conference must be conducted prior to the start of field activities and after submission of the Contractor's APP/SSHP. The HSM, site superintendent, SSHO and quality control manager must attend. The objective of the meeting will be to discuss health and safety concerns related to the impending work, discuss project health and safety organization and expectations, review and answer comments and concerns regarding the APP/SSHP or other health and safety concerns the Contractor may have. Ensure that those individuals responsible for health and safety at the project level are available and attend this meeting.

Anticipated AHAs to be developed and implemented during the performance of the Contract must also be discussed. This list of proposed AHAs will be reviewed and an agreement must be reached between the Contractor and the Contracting Officer as to which phases require an analysis. In addition, establish a schedule for the preparation, submittal, and Government review of AHAs to preclude project delays.

Deficiencies in the submitted APP will be brought to the attention of the Contractor at the Pre-Construction Conference. Revise the plan to correct deficiencies and re-submit it for acceptance. Work must not begin until there is an accepted APP.

1.5.2 Safety Briefings and Safety Meetings

Conduct and document safety meetings as required by Section 01.B of **EM 385-1-1**. Attach minutes showing contract title, signatures of attendees and a list of topics discussed to the Contractor's Daily CQC Report.

Inform the Contracting Officer to any formal safety meetings outside of the daily briefings 7 calendar days in advance. Invite the Contracting Officer to attend.

1.6 ACCIDENT PREVENTION PLAN/SITE SAFETY AND HEALTH PLAN

Develop and implement an SSHP attached to the APP as an appendix. The APP/SSHP must address all occupational safety and health hazards associated with the remedial action work. The APP/SSHP must cover each SSHP element in Section 33 of **EM 385-1-1**; **29 CFR 1910**, Section 120 (b) (4); and **29 CFR 1926** Section 65 (b) (4); and each APP element in Appendix A of **EM 385-1-1**. Overlapping elements in Section 33 and Appendix A of **EM 385-1-1** need not be duplicated in the APP/SSHP provided each safety and occupational health issue receives adequate attention and is documented in the APP/SSHP. The APP/SSHP is a dynamic document, subject to change as project operations and execution change. The APP/SSHP will require modification to address changing and previously unidentified health and safety conditions. It is the Contractor's responsibility to ensure that the APP/SSHP is updated accordingly. Submit amendments to the APP/SSHP to the Contracting Officer as the APP/SSHP is updated. For long duration projects, resubmit the APP/SSHP to the Contracting Officer annually for review. The APP/SSHP must contain all updates.

The Government considers the Prime Contractor to be the "controlling authority" for site safety and health for all work performed by the subcontractors. Contractors are responsible for informing their subcontractors of the safety provisions under the terms of the contract and the penalties for noncompliance, coordinating the work to prevent one craft from interfering with or creating hazardous working conditions for other crafts, and inspecting subcontractor operations to ensure that accident prevention responsibilities are being carried out.

1.6.1 Acceptance and Modifications

Prior to submittal, the APP/SSHP must be signed and dated by the SHM. Submit the APP/SSHP to the Contracting Officer for approval. Deficiencies in the APP/SSHP will be discussed at the Pre-Construction Conference. Revise the APP/SSHP to correct the deficiencies and resubmit for acceptance. Onsite work must not begin until the plan has been approved and accepted by the Contracting Officer. Maintain a copy of the written APP/SSHP onsite. As work proceeds, adapt the APP/SSHP to new situations and new conditions. Changes and modifications to the accepted APP/SSHP must be made with the knowledge and concurrence of the SHM, SSHO, the site Superintendent, and the Contracting Officer. Should any unforeseen hazard become evident during the performance of the work, the SSHO must bring such hazard to the attention of the SHM, the Site Superintendent, and the Contracting Officer, both verbally and in writing, for resolution as soon as possible. In the interim, take necessary action to reestablish and maintain safe working conditions in order to safeguard onsite personnel, visitors, the public, and the environment. Disregard for the provisions of this specification or the accepted APP/SSHP will be cause for stopping of work until the matter has been rectified.

1.6.2 Availability

Make the APP/SSHP available in accordance with 29 CFR 1910, Section 120 (b) (1) (v) and 29 CFR 1926, Section 65 (b) (1) (v).

1.7 DISPLAY OF SAFETY INFORMATION

1.7.1 Safety Bulletin Board

Prior to the commencement of work, erect a safety bulletin board at the job site. The safety bulletin board must include information and be maintained as required by EM 385-1-1, Section 01.A.07.

1.7.2 Safety and Occupational Health (SOH) Deficiency Tracking System

Establish a SOH deficiency tracking system in accordance with Section 01.A.13.d of EM 385-1-1 that lists and monitors the status of SOH deficiencies in chronological order. Use the tracking system to evaluate the effectiveness of the APP. A monthly evaluation of the data must be discussed in the QC or SOH meeting with everyone on the project. The list must be posted on the project bulletin board and updated daily.

1.8 SITE DESCRIPTION AND CONTAMINATION CHARACTERIZATION

1.8.1 Project Site Conditions

Project site conditions are detailed in SECTION 01 11 00 - SUMMARY OF WORK.

1.8.2 Plan Requirements

Include a site description and contamination characterization section in the APP/SSHP that addresses the following elements:

- a. Description of site location, topography, size and past uses of the site.
- b. A list of contaminants that may present occupational safety and health hazards. Create this list by evaluating the analytical results from past site investigation activities. Include chemical names, concentration ranges, affected media, locations onsite and estimated quantities/volumes to be impacted by site work if known. Review and revise the contamination characterization if new chemicals are identified as work progresses.

1.9 HAZARD/RISK ANALYSIS

Include a systematic safety and health hazard/risk analysis for each site task and operation to be performed in the APP/SSHP. The hazard/risk analysis must, as described in ANSI Z590.3, Prevention through Design, provide information necessary for determining safety and health procedures, equipment, and training to protect onsite personnel, the environment, and the public. Review available site information when preparing the "Hazard/Risk Analysis" section of the APP/SSHP. Address following elements, at a minimum.

Provide all equipment, materials, and personnel necessary to protect onsite personnel and members of the general public from injury or exposure to physical, chemical, and biological hazards. Operate a program of

protective equipment maintenance in accordance with the manufacturer's specifications. All protective equipment must be NIOSH-approved, if applicable. The Contracting Officer, or designee, will reject the use of equipment if, in their opinion, it provides less protection than that specified in the APP/SSHP.

1.9.1 Site Tasks and Operations

Include a comprehensive section in the APP/SSHP that addresses the tasks and objectives of the site operations and the logistics and resources required to complete those tasks and objectives. Based on the type of remediation required, a list of anticipated major site tasks and operations to be performed and the initial levels of protection required appears in Table 01 35 29-1.

TABLE 01 35 29 - 1 Tasks and Specific Levels of Protection		
TASK	LEVEL OF PROTECTION IN EXCLUSION ZONE¹	
Mobilization	D	
Site Preparation; Clearing	Initial:D Modified	Contingency:C or D
Groundwater Screening	Initial:D Modified	Contingency:C or D
Well Installation and Development	Initial:D Modified	Contingency:C or D
Well Surveying	D Modified	
Sampling (groundwater)	Initial: D Modified	Contingency:C or D
Amendment Injection Operations	Initial:D Modified	Contingency:C or D
Groundwater and Soil Disposal	Initial: D Modified	Contingency:C or D
Decontamination of Tools and Equipment	Initial:D Modified	Contingency:C or D
Site restoration	D Modified	
Demobilization	D	

Table Notes:

1. An explanation of various levels of personal protective equipment is included in Paragraph 1.13.

1.9.2 Hazards

The following potential hazards may be encountered during site work. These are not complete lists; therefore, expand and/or revise the list as necessary during preparation of the APP/SSHP.

1.9.2.1 Physical Hazards

The Hazard/Risk Analysis section of the APP/SSHP must describe the physical hazards associated with anticipated site operations. These include, but are not limited to, the following: heavy equipment operations; amendment injection; contaminated materials handling; pressurized containers and equipment; slips, trips, and falls; etc.

1.9.2.2 Chemical Hazards

The Hazard/Risk Analysis section of the APP/SSHP must describe the chemical, physical and toxicological properties of contaminant sources and pathways of employee exposure, anticipated onsite and offsite exposure levels, and regulatory (including Federal, State and local) or recommended protective exposure standards.

1.9.2.3 Physical Agents

The APP/SSHP must evaluate hazards associated with noise and heat/cold stress. Implement noise control in accordance with Section 95 of 29 CFR 1910.

1.9.2.4 Biological Hazards

Evaluate potential hazards associated with poisonous plants, insects, and animals in the APP/SSHP.

1.9.3 Action Levels

Utilize current EPA (including air quality standards [NAAQS]), NIOSH, or other applicable exposure standards and guidelines in developing action levels. Present the action levels and required actions (engineering controls, changes in PPE, etc.) in the APP/SSHP in both text and tabular form. Maximum acceptable action levels and the actions to be taken if an exceedance occurs appear in Table 01 35 29-2. Establish action levels for the following situation at a minimum:

- a. Implementation of engineering controls and work practices.
- b. Upgrade or downgrade in level of personal protective equipment.
- c. Work stoppage and/or emergency evacuation of onsite personnel.
- d. Prevention and/or minimization of public exposures to hazards created by site activities.

Entry into and work in a confined space will not be allowed when the oxygen reading is less than 19.5% or greater than 23.5% or if the Lower Explosive Limit (LEL) reading is greater than 10%, unless these conditions are adequately addressed in the confined space entry program. In addition, action levels for toxic atmospheres must be determined.

TABLE 01 35 29 - 2 MAXIMUM ACCEPTABLE ACTION LEVELS		
Contaminant/Agent	Action Level ¹	Action to be Taken ¹
Total VOCs/Methane/ Hydrogen Sulfide	a. 0-1 ppm VOCs, 0-10% LEL, 0-10ppm H ₂ S, sustained over a 5-minute average	a. Continue to work in Level D PPE. Continue monitoring for VOCs.
	b. 1-5 ppm VOCs, sustained over a 5-minute average	b. Proceed with caution.
	c. >5 ppm VOC, sustained over a 5-minute average	c. Stop work immediately and leave the exclusion zone. Move to assigned rally location. Notify the SSHO. The SSHO will contact the SHM and evaluate the situation. Work practices and engineering controls to be evaluated by SHM and SSHO. Following evaluation and modifications, PID reading of 0-5 ppm must be sustained over a 5-minute average before work may continue in Level D. PPE upgrades may only be performed at the discretion of the SHM.
	d. 10-25% LEL, Greater than 10 ppm H ₂ S	d. Stop work immediately and leave the exclusion zone. Move to assigned rally location. Notify the SSHO. The SSHO will contact the SHM and evaluate the situation.
Noise	>/=85 dBA ²	Evaluate use of engineering controls or lower noise producing equipment. Assess total noise exposure against OSHA PEL and assign PPE accordingly.

Table Notes:

- Changes in these initial action levels may be required during the course of this project but must only occur with the written approval of the Contracting Officer.
- OSHA Hearing Conservation Program Action Level

Table Abbreviations:

ppm - parts per million
dBA - decibels (A-weighted)

1.10 ACTIVITY HAZARD ANALYSIS

Prior to beginning each major phase of work, prepare and submit an AHA for

review and acceptance. Develop the AHA using the project schedule as the basis for the activities performed. Any activities listed on the project schedule require an AHA. The format must be in accordance with EM 385-1-1, Section 1. A major phase of work is defined as an operation involving a type of work presenting hazards not experienced in previous operations or where a new subcontractor or work crew is to perform. The analysis must define the activities to be performed and identify the sequence of work, the specific hazards anticipated, and the control measures to be implemented to eliminate or reduce each hazard to an acceptable level. Work must not proceed on that phase until the AHA has been accepted and a preparatory meeting has been conducted by the Contractor to discuss its contents with everyone engaged in the activities, including the onsite Government representatives. Continuously review and, when appropriate, modify AHAs to address changing site conditions or operations, with the concurrence of the SHM, the Site Superintendent, and the Contracting Officer. AHAs must be attached to and become a part of the APP/SSHP. Each AHA must comply with 29 CFR 1910, Subpart I, "Personal Protective Equipment".

1.11 STAFF ORGANIZATION, QUALIFICATIONS, AND RESPONSIBILITIES

Develop an organizational structure that sets forth lines of authority, responsibilities, and communication procedures concerning site safety, health, and emergency response. This organizational structure must cover management, supervisors and employees of the Contractor and subcontractors. The structure must include the means for coordinating and controlling work activities of subcontractors and suppliers. Include in the APP/SSHP a description of this organizational structure as well as qualifications and responsibilities of each of the individuals listed below. Obtain the Contracting Officer's acceptance before replacing any member of the Safety and Health Staff.

Identify the safety and health organization separately from the project's operations organizations in order to maintain the appropriate degree of independence from day-to-day activities. This independence is necessary to ensure proper implementation of the safety and health plan. The project manager is responsible for safety and health on the project including providing the proper and adequate personnel, materials, and resources to implement the safety and health program. Include the names, qualifications, duties, and responsibilities of each proposed replacement in requests for replacement of any member of the Safety and Health Staff.

1.11.1 Site Superintendent

Designate a Site Superintendent, who has responsibility to implement the APP/SSHP and the authority to direct work performed under this contract and verify compliance.

1.11.2 Safety and Health Manager

1.11.2.1 Qualifications

Utilize the services of a Certified Safety Professional (CSP) certified by the Board of Certified Safety Professionals or acceptable alternative (e.g., Certified Industrial Hygienist). Include the name, qualifications (education summary and documentation), and work experience summary of the SHM in the APP/SSHP. The SHM must have the following additional qualifications:

- a. A minimum of three years of experience in developing and implementing safety and health programs at hazardous waste sites
- b. Documented experience in supervising professional and technician-level personnel
- c. Documented experience in developing worker exposure assessment programs and air monitoring programs and techniques
- d. Documented experience in the development of PPE programs and conducting PPE hazard evaluations for the types of activities and hazards likely to be encountered on this project
- e. Documented experience in health and safety oversight and knowledge of the types of activities on this project including, but not limited to, drilling, groundwater sampling, monitoring well installation, and amendment injection, and hazards likely to be encountered.
- f. Working knowledge of State and Federal occupational safety and health regulations

1.11.2.2 Responsibilities

The SHM is responsible for the following:

- a. Be responsible for the development, implementation, oversight, and enforcement of the APP/SSHP
- b. Sign and date the APP/SSHP prior to submittal
- c. Conduct initial site-specific training
- d. Be present onsite during the first day of remedial activities and at the startup of each new major phase of work
- e. Visit the site as needed and at least once per month for the duration of activities to audit the effectiveness of the APP/SSHP. Note any safety and health deficiencies in writing with action items identified and assigned so as to resolve deficiencies.
- f. Be available for emergencies
- g. Provide onsite consultation as needed to ensure the APP/SSHP is fully implemented
- h. Coordinate any modifications to the APP/SSHP with the Site Superintendent, the SSHO, and the Contracting Officer
- i. Provide continued support for upgrading/downgrading of the level of personal protection
- j. Be responsible for evaluating air monitoring data and recommending changes to engineering controls, work practices, and PPE
- k. Review Mishap Notification and Investigation reports and results of daily inspections
- l. Serve as a member of the Contractor's quality control staff

1.11.3 Site Safety and Health Officer (SSHO)

1.11.3.1 Qualifications

Designate an individual and one alternate as the SSHO. Include the name, qualifications (education and training summary and documentation), and work experience of the SSHO and alternate in the APP/SSHP. The SSHO must have the following qualifications:

- a. A minimum of two years of experience in implementing safety and health programs at hazardous waste sites where level C PPE was required
- b. A minimum of five years of general or construction industry in managing safety or 4 years plus a safety certification (e.g., certified safety professional).
- c. Documented experience in construction techniques and construction safety procedures
- d. Working knowledge of Federal and State occupational safety and health regulations
- e. Specific training in personal and respiratory protective equipment, and in the proper use of air monitoring instruments and air sampling methods
- f. Completion of 30 Hour Construction Safety and Health course compliant with OSHA Training Institute Guidelines
- g. Certified as having completed training in First Aid and CPR by a recognized organization such as the American Red Cross.

1.11.3.2 Responsibilities

The SSHO is responsible for the following:

- a. Assist and represent the SHM in onsite training and the day-to-day onsite implementation and enforcement of the accepted APP/SSHP. The SSHO must report directly to the SHM.
- b. Be assigned to the site on a full-time basis for the duration of field activities. The SSHO must have no duties other than safety- and health-related duties. If operations are performed during more than one work shift per day, a site SSHO must be present for each shift.
- c. Have authority to ensure site compliance with specified safety and health requirements, Federal, State and OSHA regulations and all aspects of the APP/SSHP including, but not limited to, AHAs, air monitoring, use of PPE, decontamination, site control, standard operating procedures used to minimize hazards, safe use of engineering controls, the emergency response plan, spill containment program, and preparation of records by performing a daily safety and health inspection and documenting results on the Daily Safety Inspection Log in accordance with 29 CFR 1904.
- d. Complete the "Field Safety Checklist" prior to the start of construction activities. An example of this checklist is provided as an attachment to this section. The Contractor is responsible for revising this form and submitting it as part of the APP/SSHP for

approval by the Contracting Officer.

- e. Have authority to stop work if unacceptable health or safety conditions exist and take necessary action to reestablish and maintain safe working conditions.
- f. Consult with and coordinate any modifications to the APP/SSHP with the SHM, the Site Superintendent, and the Contracting Officer.
- g. Serve as a member of the Contractor's quality control staff on matters relating to safety and health
- h. Conduct mishap investigations and prepare mishap notification and investigation reports
- i. Conduct daily safety inspections and document safety and health findings in the Daily Safety Inspection Log. Track noted safety and health deficiencies to ensure that they are corrected.
- j. Recommend corrective actions for identified deficiencies and oversee the corrective actions in coordination with site management and the SHM
- k. Conduct emergency response training which must include the following: procedures, spill plans, firefighting plans, posting of emergency numbers, and medical support.
- l. Maintain a list of hazardous chemicals on site and their material Safety Data Sheets.
- m. Provide and keep a record of site safety orientation and indoctrination for Contractor employees, subcontractor employees, and site visitors.
- n. Ensure subcontractor compliance with safety and health requirements.
- o. Use and maintain OSHA's Form 300 to log work-related injuries and illnesses occurring on the project site for Prime Contractors and subcontractors, and make available to the Contracting Officer upon request. Post and maintain the Form 300A on the site Safety Bulletin Board.

1.11.4 Occupational Physician

1.11.4.1 Qualifications

Utilize the services of a licensed physician, who is certified in occupational medicine by the American Board of Preventive Medicine, or who by necessary training and experience is Board-eligible. The physician must be familiar with this site's hazards and the scope of this project. Include the medical consultant's name, qualifications, and knowledge of the site's conditions and proposed activities in the APP/SSHP.

1.11.4.2 Responsibilities

The physician is responsible for the determination of medical surveillance protocols and for review of examination/test results performed in compliance with the following: 29 CFR 1910, Section 120 (f); 29 CFR 1926, Section 65 (f); and Paragraph 1.14 - MEDICAL SURVEILLANCE.

1.11.5 Persons Certified in First Aid and CPR

At least two persons who are currently certified in first aid and CPR by the American Red Cross or other approved agency must be onsite at all times during site operations. They must be trained in universal precautions and the use of PPE as described in the Bloodborne Pathogens Standard of 29 CFR 1910, Section 1030. These persons may perform other duties but must be immediately available to render first aid when needed.

1.11.6 Safety and Health Technician

For each work crew in the Exclusion Zone, one person, designated as a Safety and Health Technician, must perform activities such as air monitoring, decontamination, and safety oversight on behalf of the SSHO. The Safety and Health Technician must have appropriate training equivalent to the SSHO in each specific area for which they are responsible and must report to and be under the supervision of the SSHO.

1.12 TRAINING

The Contractor's training program for workers performing cleanup operations and who will be exposed to contaminants must meet the following requirements.

1.12.1 General Hazardous Waste Operations Training

All personnel performing duties with potential for exposure to onsite contaminants must meet and maintain the following 29 CFR 1910.120 and 29 CFR 1926.65 (e) training requirements.

- a. 40 hours of offsite hazardous waste instruction.
- b. Three days actual field experience under the direct supervision of a trained, experienced supervisor.
- c. Eight hours refresher training annually.

Onsite supervisors must have an additional eight-hour management and supervisor training as specified in 29 CFR 1910.120 and 29 CFR 1926.65 (e) (4).

Maintain, at the work site, documentation that shows that each onsite employee or subcontractor has completed a safety and health training course appropriate for their job function and responsibility. The training certificates must be current within 12 months of the start of work and remain up-to-date during work performance.

1.12.2 Pre-entry Briefing

Prior to commencement of onsite field activities, all site employees, including those assigned only to the Support Zone, must attend a site-specific safety and health training session. This session must be conducted by the SHM and the SSHO to ensure that all personnel are familiar with requirements and responsibilities for maintaining a safe and healthful work environment. Procedures and contents of the accepted APP/SSHP and relevant sections of EM 385-1-1 must be thoroughly discussed. Each employee must sign a training log to acknowledge attendance and understanding of the training. Notify the Contracting Officer at least five days prior to the initial site-specific training session so that

Government personnel involved in the project may attend.

1.12.3 Periodic Sessions

Periodic onsite training must be conducted by the SSHO at least weekly for personnel assigned to work at the site during the following week. The training must address safety and health procedures, work practices, any changes in the APP/SSHP, AHAs, work tasks, or schedule, results of the previous week's air monitoring, and review of safety discrepancies and mishaps. Should an operational change affecting onsite field work be made, convene a meeting prior to implementation of the change to explain safety and health procedures. Site-specific training sessions for new personnel, visitors, and subcontractors must be conducted by the SSHO using the training curriculum outlines developed by the SHM. Each employee must sign a training log to acknowledge attendance and understanding of the training.

1.12.4 Site Specific Training

Document site specific training sessions in accordance with Section 01.B.02 of [EM 385-1-1](#).

The Contractor's SHM must approve a site-specific training session for the Contractor and Government personnel scheduled to work onsite. This training may be given by the SSHO. This site-specific training must consist of an initial safety and health briefing on the following information:

- a. Names of personnel and alternates responsible for site safety and health
- b. Hazards present on the site
- c. Hazard communications training
- d. Safe use of engineering controls and equipment onsite
- e. Selection, use, care, and maintenance of PPE
- f. Site control procedures, including log-in and log-out
- g. Site decontamination procedures
- h. Standard operating safety procedures
- i. Site emergency response contingency plan

The SHM must provide training as specified in [29 CFR 1910.146](#) for employees who are required to supervise, standby, or enter permit-required confined spaces. Persons involved in any aspect of the transportation of hazardous materials must be trained in accordance with [49 CFR 172 Subpart H](#).

1.13 PERSONAL PROTECTIVE EQUIPMENT

1.13.1 Site-Specific PPE Program

The Contractor's PPE Program must comply with [29 CFR 1910.132](#), [29 CFR 1910.120](#), and [EM 385-1-1](#), Section 5. Provide onsite personnel exposed to contaminants with appropriate PPE. Components of levels of protection (C,

D and modifications) must be relevant to site-specific conditions, including heat and cold stress potential and safety hazards. Use only respirators approved by NIOSH. Keep protective equipment and clothing clean and well-maintained. Include in the PPE section of the APP/SSHP site-specific procedures to determine PPE program effectiveness and for onsite fit-testing of respirators and cleaning, maintenance, inspection, and storage of PPE.

1.13.2 Levels of Protection

Operations under this contract may require work exposure to potentially hazardous materials. Provide and ensure the wearing of all necessary PPE for all personnel onsite. All personnel entering the Work Zones must don, at a minimum, level D PPE.

The SHM must establish and evaluate, as the work progresses, the levels of protection for each work activity. The SHM must also establish action levels for upgrade or downgrade in levels of PPE. Describe protocols and the communication network for changing the level of protection in the SSHP. The PPE evaluation protocol must address air monitoring results, potential for exposure, changes in site conditions, work phases, job tasks, weather, temperature extremes, individual medical considerations, etc.

1.13.2.1 Initial PPE Components

The following items constitute minimum protective clothing and equipment ensembles to be utilized during this project:

a. Level D - Work clothing, as dictated by the weather

- 1) Safety (steel toe/shank) shoes or boots meeting the requirements of [ASTM F2413](#)
- 2) Hard hat meeting the requirements of [ANSI Z89.1](#)
- 3) Safety glasses, goggles, or face shield meeting the requirements of [ANSI Z87.1](#)
- 4) Hearing protection (where required)
- 5) Nitrile, neoprene, or natural rubber gloves (when handling contaminated soils or water)
- 6) Gloves with cotton liners

b. Modified Level D - Same as Level D, and:

- 1) Disposable, hooded, one-piece, full body coveralls constructed of spun bonded olefin or polypropylene fabrics (e.g., Tyvek or equivalent)
- 2) Disposable boot covers of (minimum) 60 mil rubberized PVC

c. Level C - Modified Level D PPE and full facepiece, air purifying respirator equipped with filter cartridges approved by NIOSH for organic vapors, with a HEPA pre-filter.

1.13.2.2 Initial Minimum Levels of PPE by Task

Based on available information, the initial minimum protective equipment requirements for each major task and operation appear in Table 01 35 29-1. Review available site information, and expand and/or revise the list of tasks and operations and corresponding levels of protection during preparation of the SSHP.

Downgrade the level of protection only when:

- a. The SSHO makes the change based on site activity, air monitoring of contaminant levels, and work place practices as specified in the SSHP; and
- b. The SHM approves the change, with the knowledge and approval of the Contracting Officer.

Protective equipment must meet the requirements of the regulations listed in Table 01 35 29-3 when such equipment is required.

TABLE 01 35 29-3 OSHA STANDARDS FOR USE OF PPE		
Type of Protection	Regulation	Source
General	29 CFR 1910.132	41 CFR Part 50-204.7 General Requirements for Personal Protective Equipment
	29 CFR 1910.1000	41 CFR Part 50-204.50 except for Table Z-2, the source of which is ANSI Z3 Series (*)
	29 CFR 1910.1001 - 1045	OSHA Rulemaking
Hazard Communication	29 CFR 1910.1200	OSHA
Eye and Face	29 CFR 1910.133	ANSI Z87.1(*) Eye and Face Protection
Noise	29 CFR 1910.95	41 CFR Part 50-204.10 and OSHA Rulemaking
Hand	29 CFR 1910.138	ANSI/ISEA 105-2016(*) American National Standard for Hand Protection
Respiratory	29 CFR 1910.134	ANSI Z88.2 (*) Standard Practice for Respiratory Protection

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Head	29 CFR 1910.135	ANSI Z89.1(*) Safety Requirement for Industrial Head Protection
Foot	29 CFR 1910.136	ASTM F2413(*) Safety Toe Footwear
Electrical Protective	29 CFR 1910.137	ASTM D120(*) Standard Specification for Rubber Insulating Gloves

(*) = Latest version.

1.13.3 PPE for Government Personnel

Three (3) clean sets of PPE and clothing (excluding air purifying negative pressure respirators and safety shoes, which must be provided by individual visitors), as required for entry into the Exclusion Zone and/or Contamination Reduction Zone, must be available for use by the Contracting Officer or official visitors. Clean, maintain, and store these items. The items must be clearly marked: "FOR USE BY GOVERNMENT ONLY." Provide basic training in the use and limitations of the PPE provided.

1.14 MEDICAL SURVEILLANCE

The Contractor's medical surveillance program for workers performing cleanup operations and who will be exposed to contaminants must meet 29 CFR 1910.120 (f), 29 CFR 1926.65 (f), and the following requirements. Ensure that the Occupational Physician or the physician's designee performs the physical examinations and reviews examination results. Participation in the medical surveillance program must be without cost to employees, without loss of pay and at a reasonable time and place.

1.14.1 Frequency of Examinations

Medical surveillance program participants must receive medical examinations and consultations on the following schedule:

- a. Every 12 months.
- b. If and when the participant develops signs and symptoms indicating a possible overexposure due to an uncontrolled release of a hazardous substance on the site.
- c. Upon termination or reassignment to a job where medical surveillance program participation is not required, unless his/her previous annual examination/consultation was less than 6 months prior to reassignment or termination.
- d. On a schedule specified by the Occupational Physician.

1.14.2 Content of Examinations

The physical examination/consultation must verify the following information about the medical surveillance program participants:

- a. Baseline health conditions and exposure history
- b. Allergies, sensitivity and susceptibility to hazardous substances exposure
- c. Ability to wear PPE inclusive of NIOSH-certified respirators under extreme temperature conditions
- d. Fitness to perform assigned duties

1.14.3 Information Provided to the Occupational Physician

Provide the Occupational Physician with the following information for each medical surveillance program participant:

- a. Information on the employee's anticipated or measured exposure
- b. A description of any PPE used or to be used
- c. A description of the employee's duties as they relate to the employee's exposures (including physical demands on the employee and heat/cold stress)
- d. A copy of 29 CFR 1910, Section 120, or 29 CFR 1926, Section 65
- e. Information from previous examinations not readily available to the examining physician
- f. A copy of Section 5 of NIOSH Pub No. 85-115
- g. Information required by 29 CFR 1910, Section 134

1.14.4 Physician's Written Opinion

Before work begins, obtained and furnished a copy of the physician's written opinion for each employee to the SHM and the employee. The opinion must address the employee's ability to perform hazardous remediation work and must contain the following:

- a. The physician's verification of the employee's fitness to perform duties as well as recommended limitations upon the employee's assigned work and/or PPE usage.
- b. The physician's opinion about increased risk to the employee's health resulting from work.
- c. A statement that the employee has been informed and advised about the results of the examination.

1.14.5 Employee Certificates

Provide employee certificates for each worker performing cleanup operations with potential for contaminant-related occupational exposure. Employee certificates must be signed by the SHM and the Occupational Physician indicating that the workers meet the contract requirements for training and medical surveillance.

1.15 EXPOSURE MONITORING AND AIR SAMPLING PROGRAM

1.15.1 General

The SHM must prepare and implement an exposure monitoring/air sampling program to identify safety and health hazards and airborne levels of hazardous substances in order to ensure proper selection of engineering controls, work practices, and PPE for affected site personnel. Include action levels for upgrading/downgrading PPE in the program. Monitor for volatile organic compounds (VOCs), combustible gases, and oxygen levels.

Document, in the site log or site files, the regular calibration of each instrument used. Only individuals trained to operate this equipment are permitted to do so.

The following publications define terms and establish procedures discussed in this specification. These publications are incorporated into this specification by reference:

- a. Threshold Limit Values and Biological Exposure Indices, American Conference of Governmental Industrial Hygienists (ACGIH), [TLV/BEI Guidelines](#) (current edition)
- b. Manual of Analytical Methods, 5th. Ed., National Institute for Occupational Safety and Health (NIOSH), [NIOSH NMAM](#)
- c. OSHA Technical Manual, U.S. Department of Labor, Occupational Safety and Health Administration (OSHA), [TED 01-00-015](#)
- d. Air Contaminants Permissible Exposure Levels, [29 CFR 1910.1000](#)

Calibrate equipment utilized for air monitoring or sampling in accordance with this section before and after each use and maintained the equipment as per specified methods, manufacturer's recommendations, and good industrial hygiene practices.

1.15.2 Meteorological Monitoring

Furnish and maintain a portable meteorological station for the continuous observation and recording of wind speed, wind direction, ambient air temperature, atmospheric pressure, atmospheric humidity, solar insolation, atmospheric precipitation, and lightning strike detection. The equipment and its placement must be in conformance with EPA Ambient Monitoring Guidelines for Prevention of Significant Deterioration ([EPA PSD](#)). The station must also include a continuous readout temperature gauge and a rainfall gauge.

The meteorological station must be positioned by the SSHO to provide representative data on the overall atmospheric diffusion conditions at the site. Establish visual wind direction indicators in a central location at each active work area. Install the meteorological station in an area relatively free of trees and houses, at the office trailer or in the Support Zone of the site. The station must be able to produce a 24-hour average figure for each parameter so that the weather influences on the air samples can be characterized. Meteorological monitoring results must be documented in the Daily Safety Log by the SSHO.

Specify the calibration, audit, data reduction, and document control of

meteorological equipment and meteorological data. For the purposes of this document, it is assumed that hourly averages of all meteorological parameters during the entire air monitoring program must be collected, tabulated, and verified. Submit meteorological data with air monitoring data.

1.15.3 Real-Time Air Monitoring

1.15.3.1 Air Monitoring Equipment

Furnish and maintain real-time air monitoring equipment and all necessary calibration/audit equipment and supplies to detect and quantify VOCs, combustible gases, and oxygen levels. All equipment must be intrinsically safe.

1.15.3.2 Real Time Air Monitoring Requirements

Perform real-time air monitoring for an adequate period prior to commencement of work to establish baseline conditions for total organic vapors, explosive gases, and oxygen in the Exclusion Zone. Perform monitoring of these baseline conditions within the breathing zone of the highest-risk employee in the exclusion zones. Establish baseline conditions based on an 8-hour sample.

Monitoring for organic vapor concentrations will consist of measurements taken within 10 feet (downwind) of each Reduction Zone at the locations designated according to wind direction.

1.15.3.3 Action Levels

See Table 01 35 29-2 for maximum acceptable action levels under the Contractor's SSHP and responses to their exceedance. The Contractor is responsible for analyzing specific project circumstances and requirements and developing appropriate action levels and responses. Action levels must be approved by the Contracting Officer.

Volatile organic compounds levels exceeding 5 parts per million (ppm) above background at any active work area require upgrade in level of respiratory protection and/or a site evaluation to determine necessary controls. Should VOCs in the Support Zone exceed the ambient levels designated previously, notify personnel, and all personnel within this area must don respiratory protective equipment as described by the SSHP. The Contractor's SSHO must stop work and evaluate.

Shut down associated work location and evacuate personnel if the combustible gas meter indicated over 10 percent of the lower explosive limit on any single reading. Notify the Contracting Officer. Work can not resume until:

- a. Appropriate corrective measures are implemented; and
- b. Authorization to continue work is given by the SHM based on lower air contamination levels.

Provide real-time air monitoring for volatile organic compounds with a photoionization detector (PID - HNU or equivalent). Monitored levels in excess of the onsite action levels established by the SHM must require upgrades in levels of protection and/or site evacuation.

1.15.3.4 Air Monitoring Results

A data sheet must be developed and implemented by the SHM upon which the following real-time monitoring data must be recorded:

- a. Date and time of monitoring
- b. Air monitoring location
- c. Instrument, model number, serial number
- d. Calibration/background levels
- e. Results of monitoring
- f. SHM, SSHO, or Air Quality Specialist signature
- g. Interpretation of the data and any further recommendations by the SHM or the SSHO in consultation with the SHM

The person conducting the monitoring must sign and date the data sheets as they are filled in. The SSHO, as appropriate, must sign and date the data sheets weekly after their review. Record all measured air concentrations of particulates and exposure durations. Place records of these exposures in the employee's permanent medical files.

Give monitoring and exposure results verbally to the Contracting Officer following each site scan that indicates concentrations in excess of the action levels and documented in writing by the end of each work day.

1.16 HEAT AND COLD STRESS MONITORING AND MANAGEMENT

Document in the APP/SSHP and implement the procedures and practices in Section 6.J in [EM 385-1-1](#) to monitor and manage heat and cold stress, respectively.

1.17 SPILL AND DISCHARGE CONTROL

Develop and implement written spill and discharge containment/control procedures as part of the APP/SSHP. Address hazardous wastes, material handling equipment, and appropriate procedures for drum and container handling, opening, sampling, shipping and transport in these procedures. Describe prevention measures, such as building berms or dikes, spill control measures and material to be used (e.g., booms, absorbents), location of the spill control material, PPE required to clean up spills, disposal of contaminated material, and who is responsible to report the spill in these procedures. Appropriately berm, dike, and/or contain stored contaminated material or hazardous materials to prevent any spillage of material on uncontaminated soil/sediment.

Respond to the spill of any pollutant, contaminant, or hazardous substances (as designated in [40 CFR 302](#)) that is in custody or care of the Contractor, pursuant to this contract. Implement response within one hour, or as soon as practicable, following any mishap or release of debris, as directed by the Contracting Officer. Any direction from the Contracting Officer concerning a spill or release must not be considered a change under the contract. Comply with all applicable requirements of Federal, State, or local laws or regulations regarding any spill incident.

If the spill or discharge is reportable, and/or human health or the environment is threatened, notify the National Response Center, the State, and the Contracting Officer as soon as possible. Include in the notification of the mishap the location of the mishap, resultant damage or injury, person(s) involved, probable cause, amount of waste spilled, and any other pertinent information concerning the mishap.

1.18 MATERIALS TRANSFER SAFETY

Remove liquids and residues from tanks using explosion proof or air driven pumps. Pump motors and suction hoses must be bonded to the tank and grounded to prevent electrostatic ignition hazards. Use of a hand pump will be permitted to remove the last of the liquid from the bottom of the tanks. If a vacuum truck is used for removal of liquids or residues, the area of operation for the vacuum truck must be vapor-free. Locate the truck upwind from the tank and outside the path of probable vapor travel. Discharge the vacuum pump exhaust gases through a hose of adequate size and length downwind of the truck and tank area. Vacuum truck operating and safety practices must conform to [API RP 2219](#). Collect tank residues in drums, tanks, or tank trucks labeled according to [49 CFR 171](#) and [49 CFR 172](#) and disposed of as specified. After the materials have been transferred and the tanks have been exposed, disconnect and drain fittings and lines leading to the tanks of their contents. The contents of the lines must not spill to the environment during cutting or disconnecting of tank fittings. Transfer materials drained into US Department of Transportation (DOT)-approved drums for storage and/or transportation. Use only non-sparking or non-heat producing tools to disconnect and drain or to cut through tank fittings. Electrical equipment (e.g., pumps, portable hand tools, etc.) used for tank preparation must be explosion proof. Following cutting or disconnecting of the fittings, plug openings leading to the tanks.

1.19 DRUM AND CONTAINER HANDLING

Procedures and precautions for the handling, storage, and disposal of encountered drums and containers, which may be pressurized, must be specified in the APP/SSHP and must comply with NJDEP requirements.

1.20 CONFINED SPACE ENTRY PROCEDURES

Follow confined space entry procedures in compliance with [29 CFR 1910.146](#), "Permit-Required Confined Spaces" if permit required confined spaces are entered (e.g., tank entry, manhole, etc.).

1.21 IGNITION SOURCES

Refer to Paragraph 1.22, Fire Protection and Prevention, [NFPA 241](#) and [EM 385-1-1](#), Section 9. Make a list of ignition sources, and document procedures to prevent fire as part of the pre-emergency planning. Prohibit all sources of ignition within 50 feet of operations with a potential fire hazard. Such areas must be conspicuously and legibly posted: "NO SMOKING, MATCHES, OR OPEN FLAME." Provide sufficient clearance and shielding around heat sources to avoid ignition of combustible materials.

1.22 FIRE PROTECTION AND PREVENTION

Every member of the site team is responsible to observe and report fires and conditions that could lead to fires. Observe the fire prevention and protection requirements described in [EM 385-1-1](#). Those requirements

include:

- a. Do not use fires or open flame devices.
- b. Prohibit smoking onsite.
- c. Place one fire extinguisher, rated at least 2-A:40-B:C, in the Support Zone.
- d. Inspect and tag all fire extinguishers on a monthly basis per the requirements of NFPA 10.
- e. Fight fires onsite that can be controlled with the use of fire extinguisher.

1.23 ELECTRICAL SAFETY

Electrical installations and appliances used by the Contractor must meet updated, applicable, NFPA National Electrical Code specifications. Ground all electrical devices utilized by the Contractor or subcontractors on this project and utilize ground fault circuit interrupter (GFCI) protected outlets.

1.24 WELL INSTALLATION

Identify all buried utility lines within the work zones and take action to protect them before drilling near them. Prior to starting site preparation work for the construction of injection, extraction and monitoring wells, obtain utility clearance using the NJ One Call system, to avoid disturbing buried utilities. Perform a geophysical survey to locate potential underground structures and utilities.

1.25 GUARDING OF MACHINERY AND EQUIPMENT

Secure all equipment onsite at the end of each workday. The Contractor must provide 24-hour security for the site.

1.26 LOCKOUT/TAGOUT

This must be performed by competent employees only. Before an employee performs any servicing or maintenance on a system where the unexpected energizing, start up, or release of kinetic or stored energy could occur and cause injury or damage, isolate the system in accordance with the requirements of EM 385-1-1, Section 12. Implement hazardous energy control procedures for the protection of personnel and resources.

1.27 FALL PROTECTION

Provide fall protection measures in accordance with EM 385-1-1, Section 21.

1.28 HAZARD COMMUNICATION

Refer to subsection 1.35.3 of this section. Prepare a hazard communication plan as part of pre-emergency planning.

1.29 ILLUMINATION

Maintain illumination levels in the working zone at a minimum of 10

footcandles. If necessary, provide supplementary lighting.

1.30 SANITATION

Provide the following items to maintain a sanitary work environment:

- a. Portable toilet facilities.
- b. A source of potable water for employee consumption.
- c. A source of water and a location at which employees may wash up.
- d. Clean locations for food storage and consumption, if food is consumed at the work site.

1.31 HEARING CONSERVATION

Measure and document the noise exposure of onsite personnel, at a minimum. If necessary, make hearing protection available to all personnel involved with equipment operation.

Make all efforts to reduce noise exposures to as low as reasonably achievable. Reaching the noise action level of 85 A-weighted decibels (dBA) listed in Table 01 35 29-2 requires additional steps to reduce worker noise exposure. Where engineering controls cannot be feasibly applied, provide hearing protection for work area noise levels that are equal to or 85 dBA.

Administrative controls such as rotation of workers to reduce exposure time must not be employed.

1.32 SIGNS AND LABELS

Refer to SECTION 01 58 00 - PROJECT IDENTIFICATION.

1.33 DUST CONTROL

Use dust control throughout the work at the site and offsite. Visible dust emission must not be present. Include dust control measures in the APP/SSHP identifying the materials, equipment, and methods to be used to control dust during project operations. The SSHO must ensure that dust suppression practices are effective and being utilized. At a minimum, incorporate the following provisions into the dust control section of the APP/SSHP:

- a. Implement dust minimization controls during dusty operations, such as drilling and transportation of drill cuttings, when wind speeds exceed 15 miles per hour.
- b. Use water-based dust-suppressing agent to prevent the creation and dispersion of dust. Avoid methods that generate slippery conditions or sticky mud.
- c. Cover and seal trucks in which the rubble and contaminated debris are carried with a double, positive locking mechanism on the tailgates to control dust releases.

The SSHO must ensure that dust suppression practices are effective and are being utilized. Periodic and frequent visual surveillance must be

conducted at the active work site along transportation routes. Visible dust emission must not be present.

1.34 SEVERE STORM PLAN

In the event of a severe storm warning:

- a. Secure outside equipment and materials and place materials that could be damaged in protected areas.
- b. Check the surrounding area for loose material, equipment, debris, and other objects that could be blown away or against existing facilities.
- c. Ensure that temporary erosion controls are adequate.

1.35 SITE CONTROL MEASURES

In order to prevent the spread of contamination and control the flow of personnel, vehicles, and materials into and out of work areas, establish and describe site control measures in the APP/SSHP. The APP/SSHP must describe site control measures similar to those described in the Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities, [NIOSH Pub No. 85-115](#). The APP/SSHP must describe the methodology to be used by the SHM and SSHA in determining work zone designations and their modifications, and procedures to limit the spread of contamination. The APP/SSHP must include procedures for the implementation and enforcement of safety and health rules for all persons on the site, including employers, employees, outside contractors, Government representatives, and visitors.

1.35.1 Work Zones

Establish initial anticipated work zone boundaries (Exclusion Zone including restricted area; Contamination Reduction Zone; and Support Zone) and access points, and include the boundary delineations on the site drawings as a part of the APP/SSHP. Base delineations of work zone boundaries on the contamination characterization data and the hazard/risk analysis to be performed as described in Paragraph 1.9 - HAZARD/RISK ANALYSIS. As work progresses and field conditions are monitored, work zone boundaries may be modified with approval from the Contracting Officer. Clearly identify and mark zones in the field (using fences, tape, signs, etc.). Post a site map, showing work zone boundaries and locations of decontamination facilities, in the onsite office. Work zones must consist of the following:

Exclusion Zone (EZ): The EZ is the area where hazardous contamination is either known or expected to occur and the greatest potential for exposure exists. Entry into this area must be controlled and exit may only be made through the Contamination Reduction Zone.

Contamination Reduction Zone (CRZ): The CRZ is the transition area between the Exclusion Zone and the Support Zone. The personnel and equipment decontamination areas must be separate and unique areas located in the CRZ.

Support Zone (SZ): The SZ is defined as areas of the site where workers do not have the potential to be exposed to hazardous substances or dangerous conditions resulting from hazardous waste operations. The SZ must be secured against active or passive contamination. Site offices, parking areas, and other support facilities must be located in the SZ.

1.35.2 Site Control Log

Maintain a log of personnel visiting, entering, or working on the site. The log must include the following: date, name, agency or company, time entering and exiting the site, time entering and exiting the EZ (if applicable), and PPE utilized. Before visitors are allowed to enter the CRZ or EZ, they must show proof of current training, medical surveillance and respirator fit testing (if respirators are required for the tasks to be performed) and must fill out the Certificate of Worker or Visitor Acknowledgment. Record this visitor information, including date, in the log.

1.35.3 Communications

The APP/SSHP must identify the method by which Contractor personnel will communicate in the event of an emergency. Communications with the office trailer, if it is outside vocal range, must be by radio. Two-way radio communication is required during construction activity. Communications between the Contractor and other organizations (e.g., the Contracting Officer or the emergency response contractor) must be over the telephone. The Contracting Officer must direct safety and health correspondence to the SHM through the Contractor's Project Manager. At least the following emergency telephone numbers and information must appear in the APP/SSHP.

- a. Name, address, and phone number of medical treatment facility and physician
- b. Ambulance service's telephone number
- c. Fire department's telephone number
- d. Police department's telephone number
- e. EPA Region 2's telephone number
- f. EPA and NJDEP spill control telephone numbers
- g. Contracting Officer's telephone number
- h. City of Newark's telephone number
- i. National Response Center's telephone number

1.36 SITE SECURITY

The Contractor is responsible for securing the site.

1.37 PERSONAL HYGIENE AND DECONTAMINATION

Personnel entering the EZ or CRZ or otherwise exposed or subject to exposure to hazardous chemical vapors, liquids, or contaminated solids must adhere to the following personal hygiene and decontamination provisions. Perform decontamination in the CRZ prior to entering the SZ from the EZ. Consult Chapter 10 of [NIOSH Pub No. 85-115](#) when preparing decontamination procedures. Submit a detailed discussion of personal hygiene and decontamination facilities and procedures to be followed by site workers as part of the APP/SSHP. Train employees in the procedures, and enforce the procedures throughout site operations.

1.37.1 Decontamination Facilities

Provide a personnel decontamination facility within the CRZ. This facility must be used by both Contractor personnel and Government representatives.

1.37.2 Procedures

The APP/SSHP must outline procedures to be used for decontamination of site personnel. Instruct personnel, and advise them to observe and adhere to, performing or supervising remedial work within the EZ or CRZ or those workers exposed (or subject to exposure) to the contaminants of concern, at the site in the requirements of the personal hygiene-related provisions of this paragraph. Submit a detailed discussion of personnel decontamination and sanitation protocols to be followed by site workers as part of the APP/SSHP. Bar any personnel found to be disregarding the personal hygiene-related provisions of the APP/SSHP from the site.

Make the following facilities available to all onsite personnel:

- a. Contained storage and legal disposal of used disposable outerwear
- b. Hand and face washing facilities
- c. A facility for changing into and out of and storing work clothing separate from street clothing
- d. A lunch and/or break room

The following procedures must be followed by all onsite personnel:

- a. Disposable outerwear must not be reused, and, when removed, must be placed inside disposal containers provided for that purpose located in the CRZ.
- b. Smoking and chewing of tobacco or chewing gum is prohibited onsite.
- c. Eating and drinking is prohibited except in the designated lunch or break area, provided by the Contractor, in the SZ.
- d. All outerwear must be removed prior to entering the lunch area and prior to washing hands.
- e. Contractor personnel are required to thoroughly cleanse their hands and other exposed areas before entering the lunch area.

Establish decontamination and sanitation procedures and areas appropriate for each level of PPE currently in use onsite. Include the stations and equipment necessary for personnel decontamination and sanitation in these procedures. The following guidelines are minimum requirements for the Contractor's personnel decontamination procedures:

TABLE 01 35 29-4 LEVEL C DECONTAMINATION PROCEDURE REQUIREMENTS		
Station	Procedure	Description

<p align="center">TABLE 01 35 29-4 LEVEL C DECONTAMINATION PROCEDURE REQUIREMENTS</p>		
Station 1	Equipment Drop	Deposit equipment used onsite (tools, sampling devices and containers, monitoring instruments, radios, clipboard, etc.) on plastic drop cloths. During hot weather operations, cool down station may be set up within this area.
Station 2	Outer Garment, Boots, and Gloves Wash and Rinse	Scrub outer boots, outer gloves, and splash suit with either decontamination solution or detergent water as appropriate. Rinse off using copious amounts of water.
Station 3	Outer Boot and Glove Removal	Remove outer boots and gloves. Deposit in container with plastic liners.
Station 4	Canister or Mask Change	If worker leaves EZ to change canister (or mask), this is the last step in the decontamination procedure. Workers canister is exchanged, new outer gloves and boot covers donned, joints taped, and worker returns to duty.
Station 5	Boot and Outer Garment Removal	Remove and deposit in separate containers lined with plastic.
Station 6	Facepiece Removal	Remove facepiece. Avoid touching face with fingers. Deposit facepiece on plastic sheets.
Station 7	Gloves	Remove and deposit inner gloves in the container lined with plastic.
Station 8	Field Wash	Thoroughly wash hands and face.

TABLE 01 35 29-5 MODIFIED LEVEL D DECONTAMINATION PROCEDURE REQUIREMENTS		
Station	Procedure	Description
Station 1	Equipment Drop	Deposit equipment used onsite (tools, sampling devices and containers, monitoring instruments, radios, clipboard, etc.) on plastic drop cloths. During hot weather operations, cool down station may be set up within this area.
Station 2	Boots and Gloves Wash and Rinse	Scrub outer boots and gloves with either decontamination solution or detergent water as appropriate. Rinse off using copious amounts of water.
Station 3	Outer Boot and Glove Removal	Remove outer boots and gloves. Deposit in container with plastic liner.
Station 4	Boot, Gloves, and Outer Garment Removal	Remove and deposit boots, chemical-resistant splash suit, and inner gloves in separate containers lined with plastic.
Station 5	Field Wash	Thoroughly wash hands and face.

All personnel must enter the decontamination facility from the EZ through the inner or contaminated side of the CRZ. Leave all contaminated materials in the CRZ. Contaminated material must remain in this area until it is removed for proper disposal. Collect all wash water and decontamination solutions in appropriate containers for transport to the temporary water treatment system. Dispose of decontamination fluids in accordance with applicable Federal, State or local requirements.

Decontaminated or properly store or dispose of all PPE worn onsite at the end of the work day. The Site Superintendent is responsible for ensuring all PPE is decontaminated before being reissued, and the SSHO must verify that this task is performed.

Wash non-disposable PPE with a low-sudsing detergent, rinse with warm water, and then wipe dry with a disposable cloth. Evaluate the use of a qualified service to launder PPE. Store decontaminated PPE in a secure area of the SZ.

1.38 VEHICLE/EQUIPMENT DECONTAMINATION

Decontaminate vehicles and equipment used in the EZ in the CRZ prior to leaving the site. Address the procedures for decontamination of vehicles and equipment in the APP/SSHP.

Establish a special "clean area" for performing equipment maintenance. Use this area when personnel are required by normal practices to expose themselves to contact with soil, i.e., crawling under a vehicle to change engine oil. Decontaminate equipment by washdown in the CRZ prior to maintenance work. Maintenance such as greasing heavy equipment will not necessitate decontamination unless the job requires body contact with soil.

Seats of equipment and vehicles used in the EZ must not be cloth-covered. They must be free from cracks or holes that would allow dust to enter seat padding or must be covered with a temporary sheet vinyl covering.

1.38.1 Decontamination Facilities

Provide a decontamination station within the CRZ for decontaminating vehicles and equipment leaving the EZ. At a minimum, this facility must include a high-pressure wash area for equipment and vehicles and a steam cleaning system for use after the mud and/or site material has been cleaned from the equipment. Construct the pad to capture decontamination water, including over-spray, and allow for collection and removal of the decontamination water using sumps, dikes and ditches as required. Handle spray water from these washing procedures as provided elsewhere in these specifications.

1.38.2 Procedures

Develop and utilize procedures for equipment decontamination to prevent the spread of contamination into the SZ and offsite areas. These procedures must address disposal of contaminated products and spent materials used on the site, including containers, fluids, oils, etc. Any item taken into the EZ must be assumed to be contaminated and must be inspected and/or decontaminated before the item leaves the area. Clean and decontaminate vehicles, equipment, and materials prior to leaving the site. Handle construction material in such a way as to minimize the potential for contaminants being spread and/or carried offsite. Before they exit the site, monitor vehicles and equipment to ensure the adequacy of decontamination. Personnel engaged in vehicle decontamination must wear protective equipment including protective clothing and respiratory protection consistent with the requirements of this specification and the APP/SSHP.

1.39 EMERGENCY EQUIPMENT AND FIRST AID REQUIREMENTS

The APP/SSHP must describe the emergency and first aid equipment to be available onsite. Maintain the following items, at a minimum, onsite and available for immediate use:

- a. First aid equipment and supplies.
- b. Emergency eyewashes and showers which comply with ANSI Z358.1.
- c. Fire extinguishers with a minimum rating of 20-A:120-B:C must be provided at site facilities and in all vehicles, and at any other site

locations where flammable or combustible materials present a fire risk.

- d. Personal protective equipment.
- e. Emergency use respirators
- f. Spill control materials

1.40 EMERGENCY RESPONSE AND CONTINGENCY PROCEDURES

Develop and implement an Emergency Response Plan that meets the requirements of 29 CFR 1910, Section 120 (1) and 29 CFR 1926, Section 65 (1) as a section of the APP/SSHP. This plan must present procedures the Contractor must follow in the case of an injury or gross chemical exposure or in case the Contractor observes an emergency unrelated to the field work. In the event of any emergency associated with remedial action, without delay, alert all onsite employees that there is an emergency situation; take action to remove or otherwise minimize the cause of the emergency; alert the Contracting Officer; and institute measures necessary to prevent repetition of the conditions or actions leading to, or resulting in, the emergency. Train employees that are required to respond to hazardous emergency situations in how to respond to such emergencies. Rehearse the plan regularly as part of the overall training program for site operations. Review and revise the plan as necessary to reflect new or changing site conditions or information. Provide copies of the accepted APP/SSHP and any revisions to the affected local emergency response agencies. Address the following elements, at a minimum, in the plan:

1.40.1 Pre-Emergency Planning

Contact and meet with local emergency response agencies during the preparation of the Emergency Response Plan. Involvement of local fire, police, and rescue authorities is necessary to ensure better coordination and proper implementation of the plan. In all cases the site-specific Emergency Response Plan must be consistent with the community contingency plan regardless of whether local responders are used during remedial action. Coordination and scheduling of these activities is the Contractor's responsibility. Conduct a site visit for the appropriate response agencies. This visit and kick-off meeting should provide the agencies with the following information:

- a. Site Layout
- b. Nature and Scope of Work
- c. Schedule for Construction Activities
- d. Hazard Potentials of Materials Associated with site Activities
- e. Onsite Personnel Locations
- f. Location of Utility Lines
- g. Entrance and Egress Routes
- h. Emergency Communications
- i. Decontamination Procedures

- j. Response Times
- k. Evacuation Routes
- l. Site-Specific Safety and Health Plan
- m. Response Restraints
- n. Emergency Response Plan Components

Notify, in writing, through the USACE Project Office, the local emergency responders and the EPA of any changes to the Emergency Response Plan. Responders' participation in the Contractor's emergency drills is encouraged. Use the form provided as an attachment to this section entitled "Agreement for Emergency Response Services" as an example to develop an individual agreement between the Contractor, a local emergency responder, USACE (EPA's Contracting Party), and EPA. Include the revised form as an attachment to the APP/SSHP for approval by the Contracting Officer.

1.40.2 Emergency Response Plan Contents

The emergency response plan must address the following:

- a. Personnel roles, lines of authority, and communications for emergencies and training.
- b. Emergency recognition and prevention.
- c. Site topography, layout, and prevailing weather conditions.
- d. Criteria and procedures for site evacuation (emergency alerting procedures, employee alarm system, emergency PPE and equipment, safe distances, places of refuge, evacuation routes, site security and control).
- e. Specific procedures for decontamination and medical treatment of injured personnel.
- f. Route maps to nearest pre-notified medical facility. Site support vehicles must be equipped with maps. Visit the hospital designated in the SSHP to determine whether they can handle the types of injury that might occur at the site. At the beginning of project operations, drivers of the support vehicles must become familiar with the emergency route and the travel time required.
- g. Emergency alerting and response procedures including posted instructions and a list of names and telephone numbers of emergency contacts (physician, nearby medical facility, fire and police departments, ambulance service, Federal, State, and local environmental agencies, as well as the SHM, the Site Superintendent, the Contracting Officer and/or their alternates).
- h. Criteria for initiating community alert program, contacts, and responsibilities.
- i. Procedures for reporting incidents to appropriate government agencies. In the event that an incident such as an explosion, fire, or a spill or release of toxic materials occurs during the course of the project,

the appropriate government agencies must be immediately notified. In addition, verbally notify the Contracting Officer immediately and provide a written notification within 24 hours. The report must include the following items:

1. Name, organization, telephone number, and location of the Contractor.
2. Name and title of the person(s) reporting.
3. Date and time of the incident.
4. Location of the incident, i.e., site location, facility name.
5. Brief summary of the incident giving pertinent details including type of operation ongoing at the time of the incident.
6. Cause of the incident, if known.
7. Casualties (fatalities, disabling injuries).
8. Details of any existing chemical hazard or contamination.
9. Estimated property damage, if applicable.
10. Nature of damage and effect on contract schedule.
11. Action taken to ensure safety and security.
12. Other damage or injuries sustained, public or private.
- j. Procedures for critique of emergency response and follow up.
- k. Site security and control for incidents.
- l. Procedures to monitor and respond to severe weather, flooding and blizzards.
- m. Procedures for dealing with fires, explosives and spills.
- n. Procedures for decontaminating emergency response vehicles and equipment.

1.40.3 Injury or Illness

In the event of an injury or illness among the site personnel, the certified first aid practitioner must take control. The injured or ill person must be transferred to the medical facility designated in the Contractor's APP/SSHP. Decontamination of personnel must be accomplished prior to transfer if the time and situation permits and must be conducted under the direction of the SSHO. If contaminated persons are sent to the medical facility, they must be accompanied by the SSHO or Safety and Health Technician.

Immediately inform the Contracting Officer and SHM of any accidents, injuries, illnesses, or environmental releases associated with this contract. Paragraph 1.40.2 lists the information that must be provided in the report. The Contractor is responsible for arranging their own emergency medical treatment.

1.40.4 Evacuation

When an evacuation is necessary, all field team members must go to the reassembly point for that study area. The Emergency Response Plan must identify the reassembly points for Contractor personnel in the event of any evacuation.

1.40.5 Contingency Planning Procedures

Identify contingency planning procedures and Contractor personnel responsibilities for potential emergencies in the APP/SSHP. Place emphasis on procedures in the contingency planning section. Contingency planning must include situations that involve mobilization of the surrounding community. Schedule a meeting with the local emergency preparedness agency to discuss the contingency measures that must be followed in the event of a major emergency that may affect offsite areas. A representative of the EPA, the Contracting Officer or their representative, the Contractor and the SHM are required to attend. Prepare an agenda and chair this meeting. Send this agenda to all participating parties prior to the scheduled meeting. At this meeting, the Contractor's suggested guidelines and requirements must be presented for protecting local residents in the event of major fires and explosions and the offsite migration of releases from the site. Contingency procedures must be confirmed by consensus of the attending parties. Elements of the discussion must include:

- a. Names, responsibilities, and authority of personnel assigned to implement emergency actions and the contingency plan
- b. Procedures for detecting and quantifying airborne contamination that may migrate offsite in addition to air monitoring as required
- c. Site security in the event of an emergency
- d. Recordkeeping and reporting requirements
- e. Criteria for initiating the community contingency plan
- f. Emergency response procedures contained in the SSHP

Formally document the conclusions reached during the meeting discussion.

1.41 CERTIFICATE OF WORKER/VISITOR ACKNOWLEDGMENT

Complete and submit a copy of a Contractor-generated certificate of worker/visitor acknowledgment for each visitor allowed to enter the CRZ or EZ, and for each employee, following the example certificate provided as an attachment to this section. Include a copy of this revised certificate as part of the APP/SSHP to be approved by the Contracting Officer.

1.42 INSPECTIONS

Attach the SSHO's daily inspection logs to the Daily Quality Control reports and submit. Include the following in each entry: date, work area checked, employees present in work area, PPE and work equipment being used in each area, special safety and health issues and notes, and signature of preparer.

Drill rigs and support vehicles must be inspected and certified as safe by

a competent person prior to arrival onsite and daily prior to operations.

1.43 SAFETY AND HEALTH PHASE-OUT REPORT

Submit a Safety and Health Phase-Out Report in conjunction with the project closeout report which must be received prior to final acceptance of the work. Include the following information, at a minimum:

- a. Summary of the overall safety and health performance (mishaps, unusual events, lessons learned, etc.)
- b. Final decontamination documentation including procedures and techniques used to decontaminate equipment, vehicles, and onsite facilities
- c. Summary of exposure monitoring and air sampling accomplished during the project
- d. Signatures of the SHM and SSHO
- e. Copies of hazardous waste manifest forms indicating that proper disposal of hazardous wastes was accomplished
- f. Final physical/medical certifications
- g. Daily Safety Inspection Reports
- h. Weekly Safety Reports
- i. Training Logs
- j. Mishap Notification and Investigation Reports

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

-- End of Section --

EXAMPLE CERTIFICATE OF WORKER/VISITOR ACKNOWLEDGMENT

PROJECT NAME:

CONTRACT NO.:

PROJECT ADDRESS:

CONTRACTOR'S NAME:

EMPLOYEE'S NAME:

The contract for the above project requires the following: that you be provided with and complete formal and site specific training; that you be supplied with proper personal protective equipment including respirators; that you be trained in its use; and that you receive a medical examination to evaluate your physical capacity to perform your assigned work tasks, under the environmental conditions expected, while wearing the required personal protective equipment. These items are to be provided at no cost to you. By signing this certification, you are acknowledging that your employer has met these obligations to you.

I HAVE READ, UNDERSTAND AND AGREE TO FOLLOW THE SITE SAFETY AND HEALTH PLAN FOR THIS SITE.

Name:

Date:

FORMAL TRAINING: I have completed the following formal training courses that meet the OSHA requirements:

Date Completed:

40 hour:

8 hour supervisory:

8 hour refresher:

SITE SPECIFIC TRAINING: I have been provided and have completed the site specific training required by this Contract. The Site Safety and Health Officer conducted the training.

RESPIRATORY PROTECTION: I have been trained in accordance with the criteria in the Contractor's Respiratory Protection program. I have been trained in the proper work procedures and use and limitations of the respirator(s) I will wear. I have been trained in and will abide by the facial hair policy.

RESPIRATOR FIT TEST TRAINING: I have been trained in the proper selection, fit, use, care, cleaning, maintenance, and storage of the respirator(s) that I will wear. I have been fit tested in accordance with the criteria in the Contractor's Respiratory Program and have received a satisfactory fit. I have been assigned my individual respirator. I have been taught how to properly perform positive and negative pressure fit check upon donning negative pressure respirators each time.

MEDICAL EXAMINATION: I have had a medical examination within the last twelve months that was paid for by my employer. The examination included health history, pulmonary function tests, and may have included an evaluation of a chest x ray. A physician made a determination regarding my physical

capacity to perform work tasks on the project while wearing protective equipment including a respirator. I was personally provided a copy and informed of the results of that examination. My employer's industrial hygienist evaluated the medical certification provided by the physician and checked the appropriate blank below. The physician determined that there:

_____ were no limitations to performing the required work tasks.

_____ were identified physical limitations to performing the required work tasks.

Date medical exam completed:

Employee's Signature:

Date:

Printed Name:

Contractor's Site Safety and Health Officer
Signature:

Date:

Printed Name:

TASK HAZARD AND CONTROL REQUIREMENTS CHECKLIST

Task: _____

Initial Anticipated Hazard: _____

Initial PPE: _____

Initial Controls: _____

Initial Exposure Monitoring: _____

HAZWOPER Medical Surveillance Required	yes	no
----------------------------------------	-----	----

HAZWOPER Training Required	yes	no
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FIELD SAFETY CHECKLIST

Work

Location: _____

1. Reviewed work plans with project engineer: _____
(initial/date)

2. Requested maps of aboveground and underground utilities: _____
(initial/date)

3. Reviewed utility maps: _____
(initial/date)

(water supply, firewater, sewer, process sewer, electric, gas, telephone, other underground utilities)

4. Met with utilities representative to review utility locations and asked each representative the following questions: _____
(initial/date)

- Any underground utilities at work site location?
- Any ongoing construction that would affect field activities?
- Any chemical releases associated with utilities?
- Any other hazards associated with utilities?
- Any special requirements?

Names of utilities and their representatives:

Utility Company

Representative

[illegible]

FIELD SAFETY CHECKLIST (CONT'D)

5. Determine if any permits are required: _____
(initial/date)

Type(s): _____

6. Obtain necessary permits: _____
(yes or no)

Permit expiration date(s): _____

7. Requested SDS for any known or expected onsite chemical:

(initial/date)

8. Client's established protocol, if any:

9. Obtained final approval for commencement of work:

Comments:

DRILLING/EXCAVATION SAFETY SIGNOFF SHEET
(TO BE COMPLETED BEFORE EXCAVATION COMMENCES)

Field locations of borings/excavations/trenches at the White Chemical Corporation Superfund Site, OU3 have been evaluated for clearance of underground utilities (i.e., electrical, sewers, firewater, and other piping) as well as 10 feet clearance from overhead powerlines. Additionally, clearance has been received from client, property owner, and other affected parties.

In addition, the Contractor's Site Safety Supervisor and the drilling/excavation foreman have familiarized themselves with the Site's safety and special considerations:

	Printed Name	Signature
Project Engineer	_____	_____
Excavation Foreman	_____	_____
Drilling Contractor	_____	_____
City Engineer	_____	_____
Gas & Water	_____	_____
Electric	_____	_____
Telephone	_____	_____
TV Cable	_____	_____

Note: Drilling/excavation will commence after all affected parties have signed off.

UTILITY CLEARANCE FOR FIELD ACTIVITIES

Action: All utilities for the Site are to be cleared by the appropriate parties prior to initiating any intrusive activity.

Utilities: Power lines and electrical duct banks, telephone lines, light circuits, data lines, cable television lines, fiber optic lines, fire water pipes, potable water pipes, industrial water supply pipes, sewers, drainage pipes, storage tank piping and ventilation pipes, steam pipes, natural gas pipelines, vaults, sump pits, etc.

Where: Every location where intrusive work is scheduled.

Who: Any person having responsibility for the intrusive work or who participates in the intrusive work, and the property owner and utility representatives.

When: Before work in the target area begins.

How: "ONE CALL" agencies, property owner information, tools, eyes, and common sense. Make records based on a "MEET" or a "LOCATE".

Why: The minimum effort needed to protect life and property; there is no excuse not to.

Contacts: New Jersey "One Call" System - 1-800-272-1000.

Applications:

- Gas Stations
- Refineries
- Power Plants
- Factories
- Wall and Ceiling Installation
- Abandoned Warehouses
- Vacant City Block

AGREEMENT FOR EMERGENCY RESPONSE SERVICES

This agreement certifies:

That the (local HAZMAT team, fire fighting, police, emergency medical responder, health care providers, etc., organization responding at the Site) department received and reviewed the Emergency Response Plan for the White Chemical Corporation Superfund Site, OU3, located in Newark, New Jersey.

That on [date], the representative from the [Department] participated in an onsite visit (or conducted a meeting, depending on the organization). During the visit, [Prime Contractor] explained the details of the Site's Emergency Response Plan, including but not limited to: roads and evacuation routes, properties of hazardous materials handled at the Site, locations where site personnel would normally be working [add any other special provision], and expectations for emergency response support.

The [Prime Contractor] will notify in writing the [Department and EPA] (through the USACE Project Office) of any amendment or significant change in the Emergency Response Plan.

If applicable:

That the U.S. Environmental Protection Agency (EPA) Region 2 provided (or will provide) the following:

- Description of any site-specific training.
- Description of equipment and serial numbers, with their specific location.
- The aforementioned equipment will be fully available to the [Department] for training and familiarization but will remain EPA's property in accordance with SARA Title I Section 123 (b)(2).
- Location of information repository.
- Reference material to be kept onsite.

That through the aforementioned provisions the [Department] agrees to provide [service] in the event of an emergency or threat of an emergency at the White Chemical Corporation Superfund Site, OU3. This agreement will remain in effect for the duration of [Prime Contractor] contract or until 90 days after written notice is given by either party justifying cancellation.

Department

Prime Contractor

EPA (concurrence)

EPA's Contracting Party (concurrence)

SECTION 01 35 45

CHEMICAL DATA QUALITY CONTROL

PART 1 GENERAL

1.1 SCOPE OF WORK

This section covers requirements for the Contractor's Chemical Data Quality Control (CDQC) for Operable unit 3 (OU3) Remedial Action (RA) at the White Chemical Corporation Superfund Site. This section shall be used for preparation of a Uniform Federal Policy Quality Assurance Project Plan (UFP-QAPP), laboratory booking, monitoring of subcontract laboratory performance, data validation, data reporting, and preparation of a chemical data final report. The UFP-QAPP shall contain the necessary technical detail and directions for all sampling and field measurements and specifies all quality assurance (QA) and quality control (QC) procedures required for planning, implementation and assessment of the RA.

Collect field measurements and samples to characterize vertical and horizontal boundaries and vertical distribution of groundwater contamination; to determine monitoring well screen placement; to establish baseline conditions in the groundwater plume; to assess injection system performance; to monitor and evaluate the enhanced anaerobic degradation of site contaminants through the performance monitoring sampling events; and to characterize imported fill materials.

1.2 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only. Where reference is made to one of these standards, the revision in effect at the time of contract award applies.

U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)

40 CFR 261 Identification and Listing of Hazardous Waste

U.S. ENVIRONMENTAL PROTECTION AGENCY (EPA)

HW-3a ICP-AES Data Validation

HW-3b ICP-Mass Spectrophotometer (MS) Data Validation

HW-3c Mercury and Cyanide Data Validation

HW-32 Policy for Implementing the National Strategy for Procuring Analytical Services for all OSWER Programs

HW-33A Low/Medium Volatile Data Validation

HW-35A Semivolatile Data Validation

HW-36A Pesticide Data Validation

HW-37A	Polychlorinated Biphenyl (PCB) Aroclor Data Validation
EPA SW-846	(Revision December 2018; updates I, II, IIA, IIB, III, IIIA, IIIB, IV, V and VI) Test Methods for Evaluating Solid Waste
EPA/240/B-06/001	Guidance on Systematic Planning Using the Data Quality Objectives Process, EPA QA/G-4
EPA/540/P-87/001B	A Compendium of Superfund Field Operations Methods
EPA-542-R-20-006	National Functional Guidelines for Inorganic Superfund Methods Data Review (SFAM01.1)
EPA-540-R-20-005	National Functional Guidelines for Organic Superfund Methods Data Review (SFAM01.1)
CLP Sampler's Guide	Contract Laboratory Program Guidance for Field Samplers, EPA 540-R-20-005
EPA/600/R-04/003	National Environmental Laboratory Accreditation Conference (NELAC) Standard, Chapter 5 - Quality Systems
EPA/240/R-02/009	Guidance for Quality Assurance Project Plans, EPA QA/G-5
EPA 505-B-04-900A	Intergovernmental Data Quality Task Force (IDQTF), Uniform Federal Policy for Quality Assurance Project Plans (UFP-QAPP) Part 1 - Evaluating, Assessing, and Documenting Environmental Data Collection and Use Programs
EPA 505-B-04-900B	Intergovernmental Data Quality Task Force (IDQTF), Uniform Federal Policy for Quality Assurance Project Plans (UFP-QAPP) Part 2B - Quality Assurance/Quality Control Compendium: Minimum QA/QC Activities
EPA 505-B-04-900C	Intergovernmental Data Quality Task Force (IDQTF), Uniform Federal Policy for Quality Assurance Project Plans (UFP-QAPP) Part 2A - Workbook for UFP for QAPP, March 2005. Revised as Optimized UFP-QAPP Worksheets
Directive FEM 2012-02	Policy to Assure Competency of Laboratories, Field Sampling, and Other Organizations Generating Environmental Measurement Data under Agency-Funded Acquisitions
Directive 9200.1-103	Inclusion of Scribe into the Role of

Tracking Superfund Sampling Data,
<http://www.epa.gov/superfund/programs/clp/download/san>

EPA Region 2 Electronic Data Deliverable
Comprehensive Specification Manual
(current edition),
<http://www.epa.gov/superfund/region-2-superfund-electr>

NEW JERSEY ADMINISTRATIVE CODE (NJAC)

NJAC 7:26 Solid Waste Regulations

NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION (NJDEP)

Fill Material Guidance Fill Material Guidance for SRP Sites

U.S. ARMY CORPS OF ENGINEERS (USACE)

EM 200-1-6 Environmental Quality - Chemical Quality
Assurance for Hazardous, Toxic And
Radioactive Waste (HTRW) Projects

ER 1110-3-12 Military Engineering and Design - Quality
Management

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation;
submittals with an "FIO" designation are for information only. Submit the
following to the Contracting Officer in accordance with SECTION 01 33 00 -
SUBMITTAL PROCEDURES.

SD-01 Preconstruction Submittals

UFP-QAPP; G

Submit the UFP-QAPP at least 30 calendar days prior to the Pre-Work
Conference for approval in accordance with Paragraph 3.3.

SD-06 Test Reports

Analytical Data; FIO

Submit electronic copies of all analytical data collected at the site
in accordance with Paragraph 1.7.

Non-Conformance Reports; FIO

Submit non-conformance reports within 48-hours of the occurrence.
Report any significant problem with sampling, analytical procedures,
instrument calibration and maintenance, and project quality control.
Significant problems include, without limitation, the items specified
herein as requiring corrective actions by the Contractor.

Chemical Data Final Report (CDFR); G

Submit the CDFR within 20 calendar days of completing work at the site
and before final payment in accordance with Paragraph 3.6. Label the

report with the contract number, project name, and project location.

1.4 ACRONYMS

Clearly define all acronyms used by the Contractor that pertain to CDQC for all contract-related products and communications.

1.5 CHEMISTRY REQUIREMENTS

CDQC must be as defined in [ER 1110-3-12](#). This Engineering Regulation integrates U.S. Army Corps of Engineers (USACE) guidance on the subject and is to be supplemented by [EM 200-1-6](#) for detailed technical guidance on CDQC.

1.5.1 Site History

Project site history is detailed in SECTION [01 11 00](#) - SUMMARY OF WORK.

1.5.2 Data Quality Objectives (DQO)

1.5.2.1 Project Objective

The overall project objective is to complete amendment injections at the site to stimulate biodegradation of site contaminants in groundwater and achieve the remedial action objectives as outlined in the ROD. The ROD Remediation Goals for the site are provided in Table 01 35 45 - 1.

1.5.2.2 Sampling Objectives

Acquire samples and perform chemical parameter measurements in such a manner that the resulting data meet and support data use requirements. Both definitive and field screening data are anticipated for this project, as defined by EPA Guidance for Systematic Planning ([EPA/240/B-06/001](#)) and USACE Chemical QA for HTRW Projects ([EM 200-1-6](#)).

Generate screening quality data for data collected from process monitoring or evaluation that do not require data validation, such as data collected from groundwater screening samples, samples collected during amendment injection operation, waste characterization samples, and for health and safety monitoring.

Generate definitive level quality data to characterization groundwater quality for baseline conditions and for performance monitoring to verify that site groundwater cleanup criteria have been met.

Acquire, document, verify and report definitive level quality data to verify that specified data quality indicators (DQIs) (precision, accuracy, completeness, comparability and representativeness) measurement performance requirements are achieved. Sampling objectives must be discussed in the project plans in detail to ensure that data obtained will be of sufficient quality and quantity to meet the DQOs.

Sampling and field measurement tasks and objectives include the following:

- a. Collect groundwater screening samples from borings to delineate contamination in groundwater in accordance with SECTION [02 32 13](#) - SUBSURFACE DRILLING AND SAMPLING. The proposed action levels for groundwater screening are presented on Table 01 35 45 - 2.

- b. Collect groundwater samples from the bedrock packer testing to determine where to install the bedrock monitoring well screen in accordance with SECTION 33 51 39 - MONITORING WELLS. The proposed action levels for bedrock packer testing are presented on Table 01 35 45 - 2.
- c. Establish baseline groundwater conditions by collecting groundwater samples from the monitoring well network prior to amendment injection in accordance with SECTION 01 80 00 - PERFORMANCE SAMPLING AND ANALYSIS. The rationale for collecting the baseline groundwater conditions data is presented on Table 01 35 45 - 2. The data must be of sufficient quality to compare analytical results to ROD RGs presented in Table 01 35 45 - 1.
- d. Conduct performance monitoring through the collection of groundwater samples during several monitoring rounds in accordance with SECTION 01 80 00 - PERFORMANCE SAMPLING AND ANALYSIS. The proposed action levels for performance monitoring samples are presented on Table 01 35 45 - 2.
- e. Collection of waste disposal characterization samples from waste materials to ensure waste meets the disposal facility requirements in accordance with SECTION 02 81 00 - TRANSPORTATION AND DISPOSAL OF WASTE MATERIAL.
- f. Perform air monitoring to ensure the safety of workers in accordance with SECTION 01 35 29 - HEALTH, SAFETY, AND EMERGENCY RESPONSE PROCEDURES.
- g. Collect and analyze samples of imported fill materials from each offsite source for the parameters listed in Paragraph 1.5.3.5. Sample data must be sufficient to demonstrate that imported materials do not contain contaminant levels that are hazardous to human health or the environment. Sample results exceeding the Clean Fill Criteria (Table 01 35 45 - 5) and radiological criteria specified herein, where those numbers are not below method detection levels, are unacceptable to be used on the site. The gamma spectroscopy sample summary must include all detectable radionuclides. Imported materials must also meet gradation and physical requirements as specified in SECTION 02 10 00 - SITE PREPARATION. Imported materials must not be brought to the site without written approval from the Contracting Officer.

1.5.2.3 Chemical DQO

Acquire, document, verify and report chemical data in a manner that ensures that precision, accuracy, and completeness requirements provided in Table 01 35 45 - 3 are achieved. The UFP-QAPP must comply with the DQO process requirements specified in EPA/240/B-06/001.

1.5.3 Sampling, Analysis, and Measurement Requirements

Include sampling, analysis, and measurement requirements listed in the following subsections in the UFP-QAPP.

1.5.3.1 Groundwater Screening Sampling

Collect groundwater screening samples for 72-hour turnaround time (TAT) for TAL VOCs analysis in accordance with SECTION 02 32 13 - SUBSURFACE DRILLING AND SAMPLING.

1.5.3.2 Bedrock Packer Testing Samples

Collect groundwater samples from the bedrock packer testing for 24-hour TAT for preliminary data for TAL VOCs analysis in accordance with SECTION 33 51 39 - MONITORING WELLS.

1.5.3.3 Baseline and Performance Monitoring Groundwater Sampling

Collect groundwater samples from the monitoring well network prior to amendment injection to establish baseline conditions and in performance monitoring rounds after amendment injection. Analyze groundwater samples collected from the monitoring well network as part of baseline and performance monitoring in accordance with SECTION 01 80 00 - PERFORMANCE SAMPLING AND ANALYSIS and the Contractor's approved UFP-QAPP.

Baseline groundwater sampling TAT: All analyses to be performed for the baseline groundwater sampling event must be performed with a 7-day TAT for the preliminary unvalidated data except for VOC and TOC analysis. Analyze samples for VOC and TOC analysis with a 3-day TAT for the preliminary unvalidated data.

Performance monitoring groundwater sampling TAT: All analyses to be performed for the baseline groundwater sampling event must be performed with a 21-day TAT for the preliminary unvalidated data except for VOC and TOC analysis. Analyze samples for VOC and TOC analysis with a 3-day TAT for the preliminary unvalidated data.

Analytical data acquired during the baseline and performance monitoring program must be of definitive quality and sufficient to evaluate the effectiveness of anaerobic biodegradation and determine the timing for amendment replenishment. The action levels and DQOs of the analytical parameters are listed in Table 01 35 45 - 2 and Table 01 35 45 - 3.

Conduct the follow offsite laboratory analysis for evaluation of treatment performance:

- a. TAL Low-level VOCs, and 1-bromo-2-chloroethane
- b. TAL Trace-level VOCs, and 1-bromo-2-chloroethane
- c. Methane/ethene/ethane (MEE) and Acetylene
- d. Total organic carbon (TOC)
- e. Anions: Sulfate, Nitrate/Nitrite, and Chloride
- f. Microbial analysis - DHC, DHBt, DHG, DSB, DECO, DSM, total eubacteria, sulfate reducing bacteria, methanogens, and associated functional genes

Collect the following field measurements (field screening data) during groundwater sampling:

- a. pH
- b. Dissolved oxygen (DO)
- c. Oxidation/reduction potential (ORP)

- d. Conductivity
- e. Temperature
- f. Turbidity
- g. Ferrous iron

1.5.3.4 Waste Disposal Characterization Sampling Requirements

Collect and analyze samples of waste materials for disposal in accordance with SECTION 02 81 00 - TRANSPORTATION AND DISPOSAL OF WASTE MATERIAL and the Contractor's approved disposal facility requirements. Analyze samples for waste characteristics to determine handling, transportation, and disposal requirements. The number and volume of samples are determined by the disposal facility.

Standard analyses required for waste disposal characterization of solid materials are listed below:

- a. Paint Filter Liquid Test
- b. Toxicity Characteristic Leaching Procedure (TCLP) - Metals
- c. TCLP - VOCs
- d. TCLP - Semivolatile Organic Compounds (SVOCs)
- e. TCLP - Pesticides
- f. TCLP - Herbicides
- g. Resource Conservation and Recovery Act (RCRA) waste characteristics including corrosivity, reactivity (hydrogen cyanide and hydrogen sulfide), and ignitability
- h. TAL PCBs
- i. Moisture Content

Standard analyses required for waste disposal characterization of aqueous materials are listed below:

- a. RCRA list of metals, VOCs, SVOCs, pesticides, and herbicides
- b. RCRA waste characteristics including corrosivity, reactivity (hydrogen cyanide and hydrogen sulfide), and ignitability
- c. TAL PCBs

Analytical methods for the above parameters are included in Table 01 35 45 - 4.

Ensure that all the disposal facility requirements are met prior to shipment of waste. EPA approval is required to utilize a disposal facility for hazardous/non-hazardous waste generated at the site.

1.5.3.5 Air Monitoring for Health and Safety

Air monitoring must be performed as outlined in SECTION 01 35 29 - HEALTH, SAFETY, AND EMERGENCY RESPONSE PROCEDURES. The Contractor must monitor the air for Occupational Safety and Health Administration (OSHA) requirements for the protection of its workers

1.5.3.6 Imported Materials - Dense Graded Aggregate Sample Results

Collect imported fill material (dense-graded aggregate) samples as stated in SECTION 02 10 00 - SITE PREPARATION and NJDEP guidance document "Fill Material Guidance for Site Remediation Program (SRP) Sites, Version 4.0" ([Fill Material Guidance](#)). Compare sample results to Table 01 35 45 - 5 to ensure that material is free of chemical contamination and meets NJDEP clean fill material criteria.

Analytical parameters to verify that imported materials (dense-graded aggregate) are free of chemical contamination include the following:

- a. TAL Metals, including Mercury and Cyanide
- b. TAL Organics (VOCs, SVOCs, Pesticides, PCBs)
- c. Extractable Petroleum Hydrocarbon (EPH)
- d. Radium-226 (Ra-226) (Gamma Spectroscopy)
- e. Gamma Radiation Exposure Rate (Field Screening)
- f. pH
- j. Acid-base accounting

Analytical methods for the above parameters are included in Table 01 35 45 - 4.

The criteria for imported materials to be free of radiological contamination are listed below:

- a. Ra-226 < 3 picocuries per gram (pCi/g) (assuming a background level of 1 pCi/g)
- b. Gamma Radiation Exposure Rate < 30 micro Roentgen per hour (µR/hr)

The results of acid-base accounting must be such that the net neutralizing potential of any imported materials is greater than 20 and the neutralizing potential ratio is greater than three. Propose pH criteria in the QAPP for the Contracting Officer's approval.

1.6 QUALITY ASSURANCE/QUALITY CONTROL ELEMENTS

The Contractor is responsible for the following QA/QC elements necessary to monitor and ensure the quality of the chemical data produced.

1.6.1 Analytical Testing Laboratories

1.6.1.1 General

Comply with the Superfund Field and Analytical Services Teaming Advisory

Committee (FASTAC) policy as detailed in EPA Region 2 standard operating procedure (SOP) [HW-32](#) in selecting and implementing analytical services for this project. This policy requires use of the tiered decision tree for procuring Superfund analytical services for all non-time-critical data collection projects. For this project, all data are time critical; therefore, use a subcontractor laboratory. Comply with the following parts of the FASTAC policy.

Submit an analytical service request (ASR) form to EPA Regional Sample Control Center (RSCC) a minimum of four weeks prior to mobilization of the sampling event. Include the proposed subcontract laboratories to be used on the ASR.

Upload the ASR to the EPA's Sharepoint site. The selected subcontract laboratories must be approved by the EPA's Regional Project Manager (RPM) and USACE. Provide justification for use of a subcontract laboratory to the EPA RPM along with the completed ASR indicating the required analyses, turnaround times, and special requests. The subcontract laboratory must meet the certification requirements listed in Paragraph 1.6.1.3.

1.6.1.2 Subcontracted Laboratory Analytical Requirements

The subcontracted laboratories must provide chemical analyses by methods specified in the project specification or the Contractor's approved UFP-QAPP to achieve the project DQOs.

1.6.1.3 Subcontract Laboratory Certification

Environmental laboratory services are to be provided only by laboratories compliant with the most recently published version of the National Environmental Laboratory Accreditation Conference (NELAC) Standard Chapter 5 and Appendix requirements ([EPA/600/R-04/003](#)). The subcontract laboratory must hold a current National Environmental Laboratory Accreditation Program (NELAP) certificate for all appropriate fields-of-testing.

Before testing services can be performed by the laboratory, verify the candidate laboratory's acceptability by reviewing their certifications and qualifications. NELAP accreditation information is to be provided annually. Notify the Contracting Officer immediately of any change in status of laboratory operations that may affect ongoing compliance with these requirements. The USACE or EPA may, at any time, conduct audits (including requests for pertinent data or information) that support an environmental laboratory's self-declaration of compliance with this policy. If the USACE and/or EPA finds the laboratory is in noncompliance, utilize alternate, compliant laboratory services until such time as compliance is again demonstrated. Before performing environmental testing, the laboratory must have access to the approved UFP-QAPP.

These requirements do not apply to the laboratory conducting QuantArray-Chlor analysis.

1.6.1.4 Subcontracted Laboratory Performance

Provide oversight of subcontract laboratories to ensure continued acceptable analytical performance. Have an established a procedure to implement and monitor work to address data deficiencies noted by review and QC sample results. Also provide and implement a mechanism for providing analytical laboratories with the UFP-QAPP, for monitoring analytical performance, and for ensuring corrective action procedures are

implemented.

1.6.2 Contractor QC Sample Collection and Analysis

Collect and analyze QC samples in accordance with EPA's Contract Laboratory Program Guidance for Field Samplers ([CLP Sampler's Guide](#)), other guidance documents and the Contractor's approved UFP-QAPP. The following are the minimum QC sampling requirements:

- a. Collect field duplicates at a rate of at least one per every 20 samples to assess the overall precision of the field sampling and analytical techniques.
- b. Include one trip blank with each cooler that contains aqueous samples collected for VOC analysis to verify the presence or absence of cross-contamination in these samples from handling and shipment.
- c. Collect field (or equipment/rinsate) blanks at a frequency of one per decontamination event, not to exceed one per day, for each equipment type and for each sample matrix to assess the effectiveness of equipment decontamination.
- d. Collect field blanks to provide information about contaminants that may be introduced during sample collection, storage, and transport. The field blank is a clean sample carried to the sampling site, exposed to sampling conditions, transported to the laboratory, and treated as an environmental sample. A field blank in every cooler will identify if contamination has occurred, whether the equipment is dedicated or not.
- e. Place one cooler temperature indicator or "temperature blank" in each cooler containing samples (solid and aqueous) for analysis to verify that samples have been maintained at 0-6° Celsius (C).
- f. Collect one matrix spike/matrix spike duplicate (MS/MSD) at a rate of one per sample delivery group (SDG) as defined by EPA's Contract Laboratory Program Guidance for Field Samplers ([CLP Sampler's Guide](#)). MS/MSD are used to determine the effect of the matrix on a method's recovery efficiency and the accuracy of the laboratory analysis. MS/MSDs are not required for VOC analysis if the samples are analyzed by a CLP laboratory.

1.6.3 Documentation of Sample Collection and Analysis

Submit a trip report via EPA SharePoint within seven days of collection of the final sample in a CLP case for samples analyzed by a CLP laboratory. For larger cases or for extended sampling events, RSCC may require trip reports more frequently. The trip report must include sample locations, dates of collection and shipment, identification of QC samples, and names of laboratories to which samples were submitted. The Contractor must notify the Contracting Officer once the report is submitted.

1.6.4 Review of Primary Laboratory Data

The Contractor is responsible for the independent review of the entire data set.

1.6.5 Data Validation

Validate analytical data for samples analyzed by the Contractor's subcontract laboratory in accordance with EPA Region 2 validation SOPs [HW-3a](#), [HW-3b](#), [HW-3c](#), [HW-33A](#), [HW-35A](#), [HW-36A](#), and [HW-37A](#), as appropriate. Perform data validation in accordance with the EPA National Functional Guidelines for Inorganics Superfund Methods Review ([EPA-542-R-20-006](#)) and with EPA National Functional Guidelines for Organics Superfund Methods Review ([EPA-540-R-20-005](#)), as appropriate. The laboratory data must be validated by an organization independent of the organization generating the data. Assess the items listed below as part of the data validation. Data validation criteria must be consistent with project DQOs and discussed in the approved UFP-QAPP.

Prepare a data validation report including a summary of the independent data reviewer's findings; and a table listing each QC result outside of established criteria, the established criteria, and the validation actions. Include comments in the data validation report on how these data affect the validity of analytical results of the samples, including data qualifiers used. The data validation report must include, but not be limited to, the following parameters:

- a. Data completeness
- b. Method blanks and field blanks
- c. Holding time including sample integrity
- d. Surrogate recovery
- e. Instrument calibration
- f. Matrix spikes
- g. Continuing calibration verification
- h. Laboratory and field duplicate results
- i. Laboratory control samples
- j. Identification and Verification of sample results
- k. Internal standards

Validation reports must be submitted after each phase of work (groundwater screening and baseline and performance sampling events). The data validation reports must be submitted as an appendix to the Chemical Data Final Report discussed in Paragraph 3.6.

1.7 ANALYTICAL DATA

1.7.1 Electronic Copy of Data Package

Provide electronic analytical data packages to the Government no later than 4 weeks after receipt of analytical data packages from the subcontract laboratory. Analytical data packages must contain information to demonstrate that project's DQOs have been fulfilled.

1.7.2 Electronic Data Deliverables (EDDs)

Submit all laboratory data to the Contracting Officer in the EPA Region 2 Electronic Data Deliverable (EDD) format.

Prepare and submit to the Contracting Officer a final EDD for all data collected during the remedial action including, but not limited to, all samples listed in Paragraph 1.5.3. The EDD must contain monitoring well, sampling location, and other information as required EPA Region 2 EDD guidance. Prepare the EDD in accordance with the procedures and requirements set forth in the Comprehensive Specification Manual ([Directive 9200.1-103](#)) as described at the following website:

<https://www.epa.gov/superfund/region-2-superfund-electronic-data-submission-documents>

Include in the EDD all sample information including sample locations (horizontal coordinates and surface elevation) and sample results. Also include in the EDD an updated geo-referenced electronic base map in AutoCAD drawing exchange (DXF) format showing site features and updated site grades following the soil remediation program.

Provide the Government with a copy of the transmittal letter for all EDD submissions, identifying the data provided in the EDD. Provide the Contracting Officer with a copy of the notice from EPA that the EDD submittal was successfully uploaded.

1.8 QUALIFICATIONS

1.8.1 Chemical Quality Control Officer

At a minimum, the Contractor's Chemical Quality Control Officer must have a Bachelor's degree (BA or BS) in chemistry, and 3 years of experience with HTRW QC, including hazardous waste manifesting. The Chemical Quality Control Officer must ensure that all chemistry-related objectives including responsibilities for DQO definitions, sampling and analysis, project requirements for data documentation and validation, and final project reports are attained. The Chemical Quality Control Officer need not be present on site during routine sampling but must be available for consultation with the Government and Contractor personnel.

1.8.2 Project Chemist

At a minimum, the Contractor's Project Chemist must have: a BA or BS degree in chemistry; 3 years of experience related to investigations, studies, design and remedial actions at HTRW sites; two field seasons of experience in calibrating and operating various field monitoring devices; and 2 years of experience in the operation of an HTRW commercial laboratory with standard analytical chemistry methods common for analyzing soil, water, air and other materials for chemical contamination assessment, including data for hazardous waste manifesting. The Project Chemist must ensure that all chemistry-related goals of the program are attained.

1.8.3 Environmental Sampler

At a minimum, the Contractor's Environmental Sampler must have a BA or BS degree in chemistry or closely related scientific/technical field, 3 years of experience in the development and preparation of UFP-QAPPs, 1 year of experience in and knowledge of EPA methods for collecting environmental and hazardous waste samples and 1 year of experience in calibration and

operation of field screening equipment, e.g., photo-ionization detector (PID) or flame ionization detector (FID). The Environmental Sampler must collect all onsite samples and perform all field screening tests. The Environmental Sampler must review the sampling results and provide recommendations for the Contractor's sampling program.

1.9 COORDINATION MEETING

After the Pre-Construction Conference, before any sampling or testing, meet with the Government at the construction site to discuss the Contractor Quality Control (CQC) Plan and the UFP-QAPP. The coordination meeting must be simultaneous with any CQC coordination meeting required by SECTION 01 45 00.00 - CONTRACTOR QUALITY CONTROL unless otherwise indicated or directed. A list of definable features (DFWs) that involve chemical measurements must be agreed upon. At a minimum, each matrix (soil, water, air), and instrumental chemical parameter measurement must be a DFW. Management of the chemical data quality system including project DQOs, project submittals, chemical data documentation, chemical data assessment, required sampling and analysis protocols, and minimum data reporting requirements must be agreed upon. The meeting must serve to establish an interrelationship between the Contractor's chemical data quality management and Government chemical QA requirements.

Document meeting minutes, which must be signed by both the Contractor and the Government must be submitted. Include in the minutes all unresolved chemical issues along with conditions for resolution; these will become a part of the contract file. There may be occasions when additional conferences may be called by either party to reconfirm mutual understandings and/or to address deficiencies in the CQC system or procedures that may require the Contractor to implement corrective action.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.1 GENERAL REQUIREMENTS

The Contractor is responsible for chemical sample acquisition, sample analysis, measurements of chemical parameters, and CDQC. Establish an effective CDQC system that meets the requirements for the chemical measurement DQOs applicable to the project. The CDQC system must consist of chemical data quality management staff responsible for the UFP-QAPP, analytical procedures, minimum data reporting requirements and the organization necessary to produce the required chemical data. The system must cover chemical measurements pertaining to and required for Contractor- and subcontractor-produced chemical data. Control field screening, sampling, and testing in conjunction with remedial activities to meet all DQOs and ensure completion of work within the required time.

3.2 CONTRACTOR QUALITY CONTROL PLAN

3.2.1 General

In addition to the QC requirements specified in SECTION 01 45 00.00 - CONTRACTOR QUALITY CONTROL, the CQC Plan must incorporate qualifications, authority and responsibilities of all chemical quality management and support personnel.

3.2.2 Chemistry Elements of the CQC Plan

To cover contract-related chemical measurements by the Contractor and all subcontractors, the CQC Plan must include the following, at a minimum:

3.2.2.1 Qualifications

Names, education, experience qualifications, authorities, and decision-making responsibilities of all chemical quality management and support personnel. The CQC Plan must contain a copy of a letter from the project QC manager designating and authorizing a Chemical Quality Control Officer and chemical QC organization staff.

3.2.2.2 Authority and Responsibility

A diagram, flow chart, or figure clearly depicting the chemical data quality management and support staff, and the authority and responsibility of each of the staff for chemical sampling and analysis, procedures for corrective actions, deliverables and submittals, deviations and changes, chemical quality documentation, and data validation by the Contractor and subcontractors. The contents of this section of the CQC Plan must be included in the applicable "Project Organization" elements of the UFP-QAPP.

3.3 UNIFORM FEDERAL POLICY QUALITY ASSURANCE PROJECT PLAN(UFP-QAPP)

3.3.1 General

The UFP-QAPP must describe all chemical parameter measurements for all phases of the remedial action. Provide sufficient detail for the project team to obtain data that meet DQOs of the project. The Contractor's QAPP must be in accordance with UFP-QAPP Manuals and QA/QC standards referenced in Paragraph 1.2.

3.3.2 Level of Detail

The UFP-QAPP must contain necessary technical detail and direction such that field and laboratory personnel understand all sampling and field measurement requirements. It must document all aspects of the project, planning, implementation, assessment, corrective actions and reconciliation of completed tasks with documented planned objectives. It must contain sufficient direction and detail that onsite personnel can perform all onsite activities required to attain project DQOs, including collection and shipment of samples for offsite chemical analysis, shipment of samples for offsite analyses, and performance of onsite instrumental parameter measurements, and data documentation and reporting requirements. The level of detail in the UFP-QAPP must be such that any technically competent personnel unfamiliar with the Site can follow the plan and perform all required work. It must contain sufficient direction and detail that analytical laboratory personnel understand the analytical methods required and the project-required reporting limits, project DQIs measurement performance criteria, and project data validation and reporting requirements.

3.3.3 Appendices

The Appendices section of the UFP-QAPP must contain all Contractor standard forms, project figures and tables, and SOPs, and all references pertaining to the project requirements included in the UFP-QAPP. This includes references relating to project DQOs, standard and non-standard

measurement methods, equivalency data, relevant information excerpted from U.S. Government and regional agency guidance and regulatory documents, existing site-related documents, and other contract-related chemical analysis documents (e.g., subcontract lab method SOPs and certificates). Include reference to all applicable SOPs from [EPA/540/P-87/001B](#), Compendium of Superfund Field Operations Methods.

3.3.4 Content

The UFP-QAPP must meet the requirements of the UFP-QAPP Manual and must cover, at a minimum, the following topics:

- a. Distribution List
- b. Title and Approval Page
- c. Project Description
- d. Introduction, including Summary of Scope and Objectives, Site History and Contaminants
- e. Existing Site Data Summary - Evaluation of Secondary Data and Use Limitations
- f. Project Description/Problem Definition/Site-Specific Analysis Problems
- g. Conceptual Site Model
- h. Sampling Design and Rationale
- i. Scope and Objectives
- j. Project Schedule and Timelines
- k. Project Organization and Responsibility
- l. Personnel Responsibilities, Qualifications and Special Training Requirements
- m. Communication Pathways
- n. Field Activities and SOPs
- o. Field and Laboratory QC Samples
- p. Sampling Procedures and Container/Preservation Requirements
- q. Sample Custody, Chain-of-Custody/Sample Documentation
- r. Sample Handling/Identification
- s. Field Logbooks and Contents; Documentation Procedures
- t. Sample Packaging and Shipping
- u. Equipment Calibration Decontamination
- v. Contractor Quality Control

- w. Daily Quality Control Reports
- x. Field Quality Control and Corrective Actions
- y. Sampling Apparatus and Field Instrumentation
- z. Data Quality Objectives and Measurement Performance Criteria
- aa. Sample Custody and Holding Times
- bb. Analytical Procedures and QC Samples
- cc. Reference Limits and Evaluation of Quantitation Limit Goals
- dd. Laboratory Calibration Procedures and Frequency
- ee. Analytical Instrument Maintenance, Testing and Inspection
- ff. Laboratory QC Checks and Corrective Actions
- gg. Calculation of DQIs
- hh. Data Reduction, Review, Validation and Reporting
- ii. Laboratory Reporting Requirements
- jj. Preventive Maintenance (Field and Laboratory)
- kk. Performance and System Audits
- ll. QC Reports to Management
- mm. Project Documents and Records
- nn. Data Validation and Data Verification Procedures
- oo. Data Usability Agreement
- pp. Appendices

The UFP-QAPP must include a table of contents; crosswalk showing that all UFP-QAPP elements have been addressed; definitions, acronyms, and references pertaining to the project; and other related chemical analysis documents such as the data validation SOPs for parameters not included in the National Functional Guidelines or Regional Validation SOPs. Prepare the UFP-QAPP in accordance with EPA/240/R-02/009, EPA 505-B-04-900A, EPA 505-B-04-900B, EPA 505-B-04-900C, and any other relevant standards.

3.3.5 Sample Packaging and Shipment

Follow the procedures described in the Contract Laboratory Program Guidance for Field Samplers (EPA-540-R-20-005) for sample packing and shipment.

3.3.6 Department of Transportation

Follow all Department of Transportation (DOT) regulations under 40 CFR 261 regarding shipment of the samples.

3.4 CONTROL OF DATA QUALITY

3.4.1 General

The Contractor's CDQC program must ensure that sampling and analytical activities and the resulting chemical parameter measurement data comply with the DQOs and the requirements of the UFP-QAPP. Utilize the three-phase control system that includes a preparatory, initial and follow-up phase for each DFW. The Contractor's three-phase chemical data control process must ensure that data reporting requirements are achieved and must be implemented according to SECTION 01 45 00.00 - CONTRACTOR QUALITY CONTROL. When possible, combine the three-phase chemical data control process with that under SECTION 01 45 00.00 - CONTRACTOR QUALITY CONTROL.

3.4.2 Three-Phase Process

The preparatory phase must include a review of the relevant specification, UFP-QAPP, and all relevant SOPs for the chemical parameter measurement and chemical sample acquisition and shipment. It must include a physical examination of all required forms, materials and equipment to ensure conformance with the UFP-QAPP and that all materials are on site. It must include a demonstration of sampling procedures by the Contractor's field sampling personnel.

The initial phase must be performed at the initiation of each DFW by the CQC Representative to confirm compliance with the UFP-QAPP, including instrument calibration, operation and performance checks, sample acquisition, labeling, and shipment in accordance with required SOPs, sampling equipment decontamination, and completion of all required documentation.

The follow-up phase must require daily inspections to ensure compliance with the UFP-QAPP.

3.5 ANALYTICAL TESTING SUBCONTRACT LABORATORIES

3.5.1 General

Propose analytical subcontract laboratories to be used for time-critical sample analyses. Laboratory certification requirements must be in accordance with Paragraph 1.6.1.3. The Contractor may utilize its own laboratory to achieve the required sample analyses.

3.5.2 Laboratory Analytical Requirements

Provide chemical analyses specified in this contract through the Contractor's and/or subcontractor's laboratory. Provide chemical analyses by methods specified in the project specifications or UFP-QAPP to achieve the project DQOs. All analytical work must be done in compliance with the EPA Forum on Environmental Measurement Competency Policy (Policy to Assure Competency of Laboratories, Field Sampling, and Other Organizations Generating Environmental Measurement Data under Agency funded Acquisitions (Directive FEM 2012-02)).

3.5.3 Laboratory Performance

Monitor and ensure continued acceptable analytical performance and establish a procedure to address data deficiencies noted by review and/or

quality assurance sample results. Provide and implement a mechanism for providing analytical laboratories with the QAPP, for monitoring the laboratories' performance and for performing corrective action procedures. Acquire analytical services with NELAP-accredited and State of New Jersey-certified laboratories.

3.6 CHEMICAL DATA FINAL REPORT

After project completion, produce a CDFR that includes a summary of QC practices employed and all chemical parameter measurement activities. This includes, but is not limited to, all data analyzed by the Contractor's subcontract laboratories and all definitive data. At a minimum, include the following in the CDFR:

- a. Summary of project scope and project description.
- b. Summary of any deviations from the UFP-QAPP or the design specifications.
- c. Summary of chemical parameter measurements performed as contingent measurements.
- d. Summary discussion of resulting data including achievement of data reporting requirements.
- e. Summary of DQO parameters including achievement of project DQOs.
- f. Presentation and evaluation of the data to include an overall assessment of the quality of the data for each method and matrix.
- g. Internal QC data generated during the project, including tabular summaries correlating sample identifiers with all blanks, duplicates, other QC samples, and batch identifiers.
- h. A list of the affected sample results for each analyte (indexed by method and matrix), including the appropriate data qualifier flag (J, U, R, etc.). Specify and discuss sample results that are negatively impacted by adverse quality control criteria.
- i. Summary of field and laboratory oversight activities, providing a discussion of the reliability of the data, QC problems encountered, and a summary of the evaluation of data quality as indicated by the laboratory QC data and any other relevant findings.
- j. Conclusions and recommendations.
- k. Appendices containing chemistry data packages for all subcontract laboratory data (electronic copy) and data validation reports.

3.7 NOTIFICATION OF NONCOMPLIANCE

The Contracting Officer will notify the Contractor of any detected noncompliance with the foregoing requirements. Take immediate corrective action after receipt of such notice.

White Chemical Corporation Superfund Site, OU3
Final 100% Remedial Design

TABLE 01 35 45 - 1 ROD Remediation Goals		
Contaminant	RGs (ug/L)	Historical Maximum Detected Concentrations (ug/L)
1,2-Dichloroethane	2	240,000
Trichloroethene	1	12,000
Tetrachloroethene	1	520
1,1,2-Trichloroethane	3	4,100
1,1,2,2-Tetrachloroethane	1	4,300
Vinyl Chloride	1	4,700
1,2-Dibromo-3-chloropropane	0.02	5,700
1,2-Dibromoethane	0.03	8,800
1,1-Dichloroethene	1	2,700
cis-1,2-Dichloroethene	70	3,800
trans-1,2-Dichloroethene	100	400
1,2-Dichloropropane	1	91
1,1,1-Trichloroethane	30	47,000

Table Notes:

1. Remedial goals presented in the Record of Decision: White Chemical Corporation, Newark, Essex County, New Jersey, Operable Unit 3 - Groundwater. EPA 2012. September.
2. The maximum concentrations are those observed during the remedial investigation and the pilot study.

Acronyms:

RGs - remedial goals
ug/L - microgram per liter

<p align="center">TABLE 01 35 45 - 2 Proposed Action Levels for Analytical Parameters</p>		
Parameters	Action Level	Rationale
VOCs	None	Groundwater screening samples, for information to determine well screen placement and development of amendment injection plan
VOCs	NJDEP GWQS, Table 01 35 45-1	Performance evaluation samples
TOC	50 mg/L	Indication that injected organics are depleting
MEEA	None	For information only to evaluate biodegradation and abiotic degradation, reporting limit below 10 ug/L must be used
Anions: Sulfate, Nitrate/Nitrite, and Chloride	None	For information only to evaluate reducing conditions and the extent of anaerobic conditions, reporting limit of 1 mg/L must be used.
Ferrous iron	None	Field measurement, for evaluation of geochemical conditions
DHC, DHBt, DHG, DSB, DECO, DSM, total eubacteria, sulfate reducing bacteria, methanogens, and associated functional genes via qPCR diagnostic testing	None	For information only, 1,000 copies per liter indicates sufficient population for complete reductive dechlorination

Acronyms:

VOCs - volatile organic compound
 TOC - total organic carbon
 MEEA - methane, ethane, ethene, acetylene
 mg/L - milligram per liter
 ug/L - microgram per liter
 NJDEP - New Jersey Department of Environmental Protection
 GWQS - Ground Water Quality Standards
 DHC - Dehalococcoides spp.
 DHBt - Dehalobacter spp.
 DHG - Dehalogenimonas spp.
 DSB - Desulfitobacterium spp.
 DECO - Dehalobium chlorocoercia
 DSM - Desulfuromonas spp.
 qPCR - Quantitative Polymerase Chain Reaction

White Chemical Corporation Superfund Site, OU3
Final 100% Remedial Design

TABLE 01 35 45 - 3 Data Quality Objectives for Chemical Parameters						
Data Use	Parameter	Precision (% RPD)		Analytical Accuracy (% Recovery)		Completeness %
		Field Duplicate	Laboratory Duplicate	LCS ¹	MS ²	
Groundwater Screening	TAL VOCs	<= 50	<= 25	40-140	75-125	90
Baseline and performance monitoring groundwater sampling	TAL VOCs	<= 50	<= 25	40-140	75-125	90
	TOC	<= 25	<= 20	80-120	80-120	
	MEEA	<= 40	<= 25	80-120	75-125	
	Sulfate, Nitrate/Nitrite, Chloride	<= 25	<= 20	80-120	80-120	
	qPCR diagnostic testing	NA	NA	Cycle threshold less than 2 units	NA	
Waste Characterization	VOCs	NA	<= 25	70-130	70-130	90
TCLP/RCRA Analytes:	SVOC			70-130	70-130	
	Pesticides			80-120	30-150	
	Metals [+Mercury, Cyanide]			80-120	75-125	
	PCBs			50-130	40-140	
	RCRA Waste Characteristics	NA	<25	NA	NA	

TABLE 01 35 45 - 3 Data Quality Objectives for Chemical Parameters						
Data Use	Parameter	Precision (% RPD)		Analytical Accuracy (% Recovery)		Completeness %
		Field Duplicate	Laboratory Duplicate	LCS ¹	MS ²	
Imported fill material certification - dense graded aggregate	VOCs	50	25	70-130	70-130	90
	SVOCs	50	25	70-130	70-130	
	Pesticides	50	25	40-140	40-140	
	PCBs	50	25	40-140	40-140	
	Metals	100	25	80-120	75-125	
	Mercury	50	25	80-120	75-125	
	Cyanide	50	25	80-120	75-125	
	EPH	50	25	40-140	40-140	
	Radium-226	50	35	75-125	--	
	pH	50	25	+/- 0.05	NA	
	Acid base accounting	50	25	80-120	NA	

Table Notes:

Source: Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods, EPA SW-846, Third Edition, Final Updates I (1993), II (1995), IIA (1994), IIB (1995), III (1997), IIIA (1999), IIIB (2005), IV (2008), V (2014), and VI (various); NJDEP Site Remediation Program Data of Known Quality Protocols Technical Guidance, April 2014.

1. Laboratory established control limits may be used in place of the listed control limits.
2. Limits are advisory. The laboratory must calculate and document the precision (laboratory duplicate) and accuracy of the sample matrix spike results for this site.

Acronyms:

LCS Laboratory Control Sample
MS Matrix Spike
NA Not Applicable
PCBs polychlorinated biphenyls
RPD relative percent difference
VOC Volatile Organic Compound
SVOC Semivolatile Organic Compound

White Chemical Corporation Superfund Site, OU3
Final 100% Remedial Design

TAL Target Analyte List of the EPA Contract Laboratory Program
TCLP Toxicity Characteristics Leaching Procedure
RCRA Resource Conservation and Recovery Act

White Chemical Corporation Superfund Site, OU3
Final 100% Remedial Design

TABLE 01 35 45 - 4 Analytical Methods for Chemical Parameters			
Data Use	Parameter	Analytical Method (All methods are based on EPA SW-846 except as noted)	
		Extraction	Analysis
Groundwater Screening	TAL VOCs	5030B/5031	8260D
Baseline and performance monitoring groundwater sampling	TAL VOCs	5030B/5031	8260D
	TOC	NA	9060
	MEEA	NA	RSK175
	Sulfate, Nitrate, Nitrate, Chloride	NA	300
	DHC, DHBt, DHG, DSB, DECO, DSM, total eubacteria, sulfate reducing bacteria, methanogens, and associated functional genes	NA	qPCR diagnostic testing

White Chemical Corporation Superfund Site, OU3
Final 100% Remedial Design

TABLE 01 35 45 - 4 Analytical Methods for Chemical Parameters			
Data Use	Parameter	Analytical Method (All methods are based on EPA SW-846 except as noted)	
		Extraction	Analysis
Waste Characterization - Solids	TCLP VOC	1311, 5030B	8260D
	TCLP SVOC	1311, 3510C/ 3520C	8270D
	TCLP Pesticide	1311, 3510C/ 3520C	8081B
	TCLP Herbicide	1311, 8151A	8151A
	TCLP Metals	1311, 3010A	6010C, 7471A (mercury)
	PCBs	3540C/3541	8082A
	Paint Filter Test	NA	9095B
	Reactivity	NA	Cyanide Reactivity-Cyanide - 9014 Reactivity-Sulfide - 9034
	Corrosivity	NA	1110A/9040C
	Ignitability	NA	1010A
	Moisture Content	NA	ASTM D 2216 - 10
Waste Characterization - Aqueous	VOCs	5030B/5031	8260D
	SVOCs	3540C	8270D
	PCBs	3540C/3541	8082A
	Pesticides	3510C/ 3520C	8081B
	Metals	3050B	6010C
	Mercury	NA	7471A
	Herbicides	8151A	8151A
	Reactivity - Cyanide Sulfide	NA	9014 9034
	Corrosivity	NA	1110A/9040C
	Ignitability	NA	1010A

White Chemical Corporation Superfund Site, OU3
Final 100% Remedial Design

TABLE 01 35 45 - 4 Analytical Methods for Chemical Parameters			
Data Use	Parameter	Analytical Method (All methods are based on EPA SW-846 except as noted)	
		Extraction	Analysis
Imported fill material certification - dense graded aggregate	TAL VOCs	5030B/5031	8260D
	TAL SVOCs	3540C	8270D
	TAL Pesticides	3510C/3520C	8081B
	TAL Metals	3050B	6010C
	Mercury	NA	7471B
	Cyanide	NA	9012B/9010C
	EPH	NA	NJDEP EPH Method Revision 3
	Radium - 226	NA	HASL-300 or EPA approved method
	pH	NA	9045D
	Acid base accounting	NA	SOBEK Method or modified SOBEK method

TABLE 01 35 45 - 5 Clean Fill Criteria (mg/kg)		
Contaminant	CAS No.	Clean Fill Criteria
Acenaphthene	83-32-9	50,000
Acetophenone	98-86-2	3.6
Aldrin	309-00-2	0.13
Aluminum	7429-90-5	NA
Anthracene	120-12-7	250,000
Antimony	7440-36-0	5.4
Arsenic	7440-38-2	19
Atrazine	1912-24-9	0.33
Barium	7440-39-3	2,100
Benzaldehyde	100-52-7	910
Benzene	71-43-2	0.0094
Benzo(a)anthracene (1,2-Benzanthracene)	56-55-3	0.71

White Chemical Corporation Superfund Site, OU3
Final 100% Remedial Design

TABLE 01 35 45 - 5 Clean Fill Criteria (mg/kg)		
Contaminant	CAS No.	Clean Fill Criteria
Benzo(a)pyrene	50-32-8	2.3
Benzo(b)fluoranthene (3,4-Benzofluoranthene)	205-99-2	23
Benzo(k)fluoranthene	207-08-9	230
Beryllium	7440-41-7	0.7
1,1'-Biphenyl	92-52-4	450
Bis(2-chloroethoxy)methane	111-91-1	2,700
Bis(2-chloroethyl)ether	111-44-4	0.33
Bis(2-ethylhexyl)phthalate	117-81-7	14
Bromodichloromethane (Dichlorobromomethane)	75-27-4	0.005
Bromoform	75-25-2	0.018
Bromomethane (Methyl bromide)	74-83-9	0.043
2-Butanone (Methyl ethyl ketone) (MEK)	78-93-3	0.98
Butylbenzyl phthalate	85-68-7	29
Cadmium	7440-43-9	1.9
Caprolactam	105-60-2	16
Carbon disulfide	75-15-0	3.7
Carbon tetrachloride	56-23-5	0.0075
Chlordane (alpha and gamma)	57-74-9	1.4
4-Chloroaniline	106-47-8	0.23
Chlorobenzene	108-90-7	0.64
Chloroethane (Ethyl chloride)	75-00-3	NA
Chloroform	67-66-3	0.33
Chloromethane (Methyl chloride)	74-87-3	1,200
2-Chloronaphthalene	91-58-7	67,000
2-Chlorophenol (o-Chlorophenol)	95-57-8	0.76
Chrysene	218-01-9	2,300
Cobalt	7440-48-4	90
Copper	7440-50-8	910
Cyanide	57-12-5	20
Cyclohexane	110-82-7	NA
4,4'-DDD	72-54-8	0.47
4,4'-DDE	72-55-9	0.47
4,4'-DDT	50-29-3	0.67
Dibenz(a,h)anthracene	53-70-3	2.3

White Chemical Corporation Superfund Site, OU3
Final 100% Remedial Design

TABLE 01 35 45 - 5 Clean Fill Criteria (mg/kg)		
Contaminant	CAS No.	Clean Fill Criteria
Dibromochloromethane (Chlorodibromomethane)	124-48-1	0.005
1,2-Dibromo-3-chloropropane	96-12-8	0.005
1,2-Dibromoethane	106-93-4	0.005
1,2-Dichlorobenzene (o-Dichlorobenzene)	95-50-1	11
1,3-Dichlorobenzene (m-Dichlorobenzene)	541-73-1	11
1,4-Dichlorobenzene (p-Dichlorobenzene)	106-46-7	1.4
3,3'-Dichlorobenzidine	91-94-1	3.9
Dichlorodifluoromethane	75-71-8	38
1,1-Dichloroethane	75-34-3	0.24
1,2-Dichloroethane	107-06-2	0.0095
1,1-Dichloroethene	75-35-4	0.0069
1,2-Dichloroethene (cis)	156-59-2	0.35
1,2-Dichloroethene (trans)	156-60-5	0.56
2,4-Dichlorophenol	120-83-2	0.19
1,2-Dichloropropane	78-87-5	0.0058
1,3-Dichloropropene (total)	542-75-6	0.0063
Dieldrin	60-57-1	0.024
Diethylphthalate	84-66-2	44
2,4-Dimethylphenol	105-67-9	2.3
Di-n-butyl phthalate	84-74-2	91,000
2,4-Dinitrophenol	51-28-5	0.33
2,4-Dinitrotoluene/ 2,6-Dinitrotoluene (mixture)	25321-14-6	0.27
Di-n-octyl phthalate	117-84-0	9,100
1,4-Dioxane	123-91-1	0.067
Endosulfan I and Endosulfan II (alpha and beta)	115-29-7	7,800
Endrin	72-20-8	1.6
Ethylbenzene	100-41-4	15
Extractable Petroleum Hydrocarbons (Category 1)	Various	75,000
Extractable Petroleum Hydrocarbons (Category 2)	Various	NA
Fluoranthene	206-44-0	33,000

White Chemical Corporation Superfund Site, OU3
Final 100% Remedial Design

TABLE 01 35 45 - 5 Clean Fill Criteria (mg/kg)		
Contaminant	CAS No.	Clean Fill Criteria
Fluorene	86-73-7	33,000
alpha-HCH (alpha-BHC)	319-84-6	0.0023
beta-HCH (beta-BHC)	319-85-7	0.0046
Heptachlor	76-44-8	0.083
Heptachlor epoxide	1024-57-3	0.081
Hexachlorobenzene	118-74-1	0.17
Hexachloro-1,3-butadiene	87-68-3	0.17
Hexachlorocyclopentadiene	77-47-4	2.5
Hexachloroethane	67-72-1	0.17
2-Hexanone	591-78-6	0.15
Indeno(1,2,3-cd)pyrene	193-39-5	23
Isophorone	78-59-1	0.23
Isopropylbenzene		22
Lead	7439-92-1	90
Lindane (gamma-HCH) (gamma-BHC)	58-89-9	0.0035
Manganese	7439-96-5	31,000
Mercury	7439-97-6	0.1
Methoxychlor	72-43-5	4,600
Methyl acetate	79-20-9	22
Methylene chloride (Dichloromethane)	75-09-2	0.013
2-Methylnaphthalene	91-57-6	3.1
2-Methylphenol (o-Creosol)	95-48-7	0.77
4-Methylphenol (p-Creosol)	106-44-5	0.75
Methyl tert-butyl ether	1634-04-4	0.25
Naphthalene	91-20-3	19
Nickel (Soluble salts)	7440-02-0	48
4-Nitroaniline	100-01-6	130
Nitrobenzene	98-95-3	0.17
N-Nitrosodi-n-propylamine	621-64-7	0.17
N-Nitrosodiphenylamine	86-30-6	1.1
2,2'-oxybis(1-chloropropane)	108-60-1	1.9
Pentachlorophenol	87-86-5	0.33
Phenol	108-95-2	21
Total Polychlorinated biphenyls (PCBs)	1336-36-3	1.1
Pyrene	129-00-0	25,000
Selenium	7782-49-2	11
Silver	7440-22-4	0.5
Styrene	100-42-5	2.1

TABLE 01 35 45 - 5 Clean Fill Criteria (mg/kg)		
Contaminant	CAS No.	Clean Fill Criteria
1,2,4,5-Tetrachlorobenzene	95-94-3	390
1,1,2,2-Tetrachloroethane	79-34-5	0.0069
Tetrachloroethene (PCE)	127-18-4	0.0086
2,3,4,6-Tetrachlorophenol	58-90-2	26
Toluene	108-88-3	7.8
Toxaphene	8001-35-2	2.3
1,2,4-Trichlorobenzene	120-82-1	0.52
1,1,1-Trichloroethane	71-55-6	0.2
1,1,2-Trichloroethane	79-00-5	0.017
Trichloroethene (TCE)	79-01-6	0.0065
Trichlorofluoromethane	75-69-4	29
2,4,5-Trichlorophenol	95-95-4	68
2,4,6-Trichlorophenol	88-06-2	0.86
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon TF)	76-13-1	NA
1,2,4-Trimethylbenzene	95-63-6	13,000
Vanadium	7440-62-2	6,500
Vinyl chloride	75-01-4	0.0067
Xylenes (total)	1330-20-7	19
Zinc	7440-66-6	930

Table Notes:

1. Clean fill criteria considers the requirement in New Jersey's Clean Fill Guidance to analyze for TAL/TCL and EPH, and the New Jersey Soil Remediation Standards (NJAC 7:26D) for the Ingestion-Dermal Exposure Pathway - Non-Residential (Table 2), the Inhalation Exposure Pathway - Non-residential (Table 4), and the Migration to Ground Water (Table 5).

-- End of Section --

SECTION 01 45 00.00

CONTRACTOR QUALITY CONTROL

PART 1 GENERAL

1.1 SCOPE OF WORK

Furnish the labor, supervision, materials, equipment and services required to prepare a Contractor Quality Control (CQC) Plan for approval by the Government and to perform Contractor quality control in accordance with the approved CQC Plan.

1.2 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only. Where reference is made to one of these standards, the revision in effect at the time of contract award apply.

ASTM INTERNATIONAL (ASTM)

ASTM D3740	Minimum Requirements for Agencies Engaged in the Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction
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ASTM E329	Standard Specification for Agencies Engaged in the Testing and/or Inspection of Materials Used in Construction
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1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals with an "FIO" designation are for information only. Submit the following to the Contracting Officer in accordance with SECTION 01 33 00 - SUBMITTAL PROCEDURES.

The CQC organization is responsible for certifying that all submittals comply with the contract requirements and are submitted in accordance with the date on the submittal register. CQC personnel must also make physical checks of materials and equipment before installation to ensure compliance with approved submittals.

SD-01 Preconstruction Submittals

CQC Plan; G

Submit a CQC Plan for approval, at least 14 calendar days prior to the Pre-Work Conference, as specified in Paragraph 3.2.

SD-03 Product Data

CQC Organizational Changes; G

Submit any CQC organizational changes made during the contract period to the Government for acceptance.

Daily CQC Report; FIO

Submit a Daily CQC Report as specified in Paragraph 3.6.7.
Generate the reports using the Resident Management System (RMS) in accordance with SECTION 01 45 00.15 - RESIDENT MANAGEMENT SYSTEM CONTRACTOR MODE (RMS CM).

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.1 GENERAL REQUIREMENTS

Establish and maintain an effective quality control (QC) system that complies with FAR 52.246-12 Inspection of Construction. QC consists of plans, procedures, and organization necessary to produce an end product which complies with the Contract requirements. The QC system covers all construction operations, both onsite and offsite, and must be keyed to the proposed construction sequence. The project superintendent will be held responsible for the quality of work and is subject to removal by the Contracting Officer for non-compliance with the quality requirements specified in the Contract. In this context the highest level manager responsible for the overall construction activities at the site, including quality and production, is the project superintendent. The project superintendent maintains a physical presence at the site at all times and is responsible for all construction and related activities at the site, except as otherwise acceptable to the Contracting Officer.

3.2 CONTRACTOR QUALITY CONTROL PLAN

3.2.1 General

Furnish for review by the Government, not later than 30 calendar days after receipt of task order award but no later than 14 days prior to the Pre-Construction Quality Control conference, the CQC Plan proposed to implement the requirements of the Contract Clause titled "Inspection of Construction". The plan must identify personnel, procedures, control, instructions, tests, records, and forms to be used. The Government will consider an interim plan for the first 90 calendar days of operation. Construction will be permitted to begin only after acceptance of the CQC Plan or acceptance of an interim plan applicable to the particular feature of work to be started. Work outside of the DFW included in an accepted interim plan will not be permitted to begin until acceptance of a CQC Plan or another interim plan containing the additional features of work to be started.

3.2.2 Content of the CQC Plan

Include, as a minimum, the following to cover all construction-operations, both onsite and offsite, including work by subcontractors fabricators, suppliers and purchasing agents:

- a. A description of the quality control organization, including a chart showing lines of authority and acknowledgment that the CQC staff must implement the three-phase control system for all aspects of the work specified. The staff must include a CQC System Manager who reports to an officer in the Contractor's organization above the Project Superintendent. The CQC System Manager is responsible for both quality

and production.

- b. The name, qualifications (in resume format), duties, responsibilities, and authorities of each person assigned a CQC function. Clear indication that CQC System Manager will have no duties other than quality control.
- c. A copy of the letter to the CQC System Manager signed by an authorized official of the firm which describes the responsibilities and delegates sufficient authority to adequately perform the functions of the CQC System Manager, including authority to stop work which is not in compliance with the contract. Letters of direction to all other various quality control representatives outlining duties, authorities, and responsibilities must be issued by the CQC System Manager. Furnish copies of these letters to the Contracting Officer.
- d. Procedures for scheduling, reviewing, certifying, and managing submittals, including those of subcontractors, offsite fabricators, suppliers, and purchasing agents. These procedures must be in accordance with SECTION 01 33 00 - SUBMITTAL PROCEDURES.
- e. Control, verification, and acceptance testing procedures for each specific test to include the test name, specification paragraph requiring test, feature of work to be tested, test frequency, and person responsible for each test. Laboratory facilities approved by the Contracting Officer are required to be used. Incorporate all tests required by the Contract Documents (including systems commissioning and operating tests) to derive the above list of testing information which must be presented in matrix form as part of the CQC Plan. This matrix must be suitable for use by the Contractor and the Government as a checklist to control testing to be done on the contract. Coordinate any additional test submission or plan requirements for Mechanical and Electrical Systems with the appropriate specialized specification section if applicable.
- f. Procedures for tracking preparatory, initial, and follow-up control phases and control, verification, and acceptance tests including documentation. Provide a matrix of Preparatory and Initial Inspections including specification reference paragraph, the name of the DFW, and spaces for date performed, results, and names of attendees.
- g. Procedures for tracking construction deficiencies from identification through acceptable corrective action. These procedures must establish verification that identified deficiencies have been corrected.
- h. Reporting procedures, including proposed reporting formats.
- i. A list of the DFWs. A DFW is a task that is separate and distinct from other tasks and has separate control requirements. It could be identified by different trades or disciplines, or it could be work by the same trade in a different environment. Although each section of the specifications may generally be considered as a DFW, there is frequently more than one definable feature under a particular section. This list must cover all features of work on the project and must be agreed upon during the coordination meeting.
- j. A brief explanation of the duties of the CQC organization with respect to safety. A separate Site Safety and Health Plan is required for submission and acceptance.

- k. The Contractor's plan for training all CQC personnel in the CQC System.
- l. Blank copies of QC checklists to be used to check the work in the field.

3.2.3 Acceptance of Plan

Acceptance of the Contractor's plan is required prior to the start of construction. Acceptance is conditional and will be predicated on satisfactory performance during the construction. The Government reserves the right to require the Contractor to make changes in the CQC Plan and operations including removal of personnel, as necessary, to obtain the quality specified.

3.2.4 Notification of Changes

After acceptance of the CQC Plan, notify the Contracting Officer in writing of any proposed change. Proposed changes are subject to acceptance by the Contracting Officer.

3.3 PRE-CONSTRUCTION QUALITY CONTROL CONFERENCE (MUTUAL UNDERSTANDING MEETING)

After the Pre-Work Conference, before start of construction, and prior to acceptance by the Government of the CQC Plan, meet with the Government and discuss the CQC System. The initial plan submitted must be found acceptable by the Government before the Coordination Meeting can be held. During the meeting, a mutual understanding of the system details will be developed, including the forms for recording the CQC operations, control activities, testing, administration of the system for both onsite and offsite work, and the interrelationship of the Contractor's management and control with the Government's Quality Assurance. Prepare minutes of the meeting, which must be signed by both the Contractor and the Contracting Officer, and submit to the Contracting Officer in accordance with SECTION 01 30 00 - ADMINISTRATIVE REQUIREMENTS. The minutes will become a part of the contract file. There may be occasions when subsequent conferences will be called by either party to reconfirm mutual understandings and/or address deficiencies in the CQC System or procedures that may require corrective action by the Contractor.

3.4 QUALITY CONTROL ORGANIZATION

3.4.1 Personnel Requirements

The requirements for the CQC organization are a Safety and Health Manager, CQC System Manager, and sufficient number of additional qualified personnel to ensure safety and Contract compliance. The Safety and Health Manager reports directly to a senior project (or corporate) official independent from the CQC System Manager. The Safety and Health Manager must also serve as a member of the CQC Staff. Personnel identified in the technical provisions as requiring specialized skills to assure the required work is being performed properly must also be included as part of the CQC organization. The Contractor's CQC staff must maintain a presence at the site at all times during progress of the work and must have complete authority and responsibility to take any action necessary to ensure Contract compliance. The CQC staff will be subject to acceptance by the Contracting Officer. Provide adequate office space, filing systems

and other resources as necessary to maintain an effective and fully functional CQC organization. Promptly complete and furnish all letters, material submittals, shop drawing submittals, schedules and all other project documentation to the CQC organization. The CQC organization is responsible for maintaining these documents and records at the site at all times, except as otherwise acceptable to the Contracting Officer.

3.4.2 CQC System Manager

Identify as CQC System Manager an individual within the Contractor's organization at the site of the work who is responsible for overall management of CQC and must have the authority to act in all CQC matters for the Contractor. The CQC System Manager must be a graduate engineer, graduate architect, or a graduate of construction management, or must hold a state Professional Engineer's license, with a minimum of 2 years construction experience on construction similar to this contract, including one year as a QC representative. The CQC System Manager may also be a construction person with a minimum of 4 years in related work, including one year as a QC representative. This CQC System must be on the Site at all times during construction and must be employed by the Contractor. Identify an alternate for the CQC System Manager in the CQC Plan to serve in the event of the CQC System Manager's absence. The requirements for the alternate will be the same as for the designated CQC System Manager. The CQC System Manager must not be assigned duties other than Quality Control.

3.4.3 Organizational Expertise

The CQC organization, which includes the CQC System Manager and additional qualified personnel, must at a minimum possess general corporate technical knowledge of all aspects of the project, and must successfully execute the CQC System on all aspects of the project. Individuals possessing experience in specialized areas must be added to the organization as required during periods when such specialty areas are being executed. Examples of such specialized areas would include HVAC, electrical distribution and substations, roofing, telecommunication systems, fire protection and alarm systems, computer installations, specialized welding, specialized finishes, precast concrete installation, modular housing, specialized geotechnical work, surveying, chemical data acquisition, hazardous material removal and disposal, medical monitoring, etc., depending on the nature of the particular project. Demonstrate that such additional qualified personnel have received sufficient training and indoctrination into the CQC System, and that these personnel properly execute the requirements of the CQC System within their areas of expertise.

3.4.4 Additional Requirement

In addition to the above experience and education requirements, the CQC System Manager and Alternate CQC System Manager are required to have completed the Construction Quality Management (CQM) for Contractors course within the last five years. The Construction Quality Management Training certificate expires after 5 years. If the CQC System Manager's certificate has expired, they must retake the course to remain current.

If the CQC System Manager does not have a current certification, they must obtain the CQM for Contractors course certification within 90 days of award. This course is periodically offered by the Naval Facilities Engineering Command and the Army Corps of Engineers. Contact the

Contracting Officer for information on the next scheduled class.

3.4.5 Organizational Changes

Maintain the CQC staff at full strength at all times. When it is necessary to make changes to the CQC staff, revise the CQC Plan to reflect the changes and submit the changes to the Contracting Officer for acceptance.

3.5 SUBMITTALS AND DELIVERABLES

Submittals, if needed, have to comply with the requirements in SECTION 01 33 00 - SUBMITTAL PROCEDURES. The CQC organization is responsible for certifying that all submittals and deliverables are in compliance with the contract requirements.

3.6 CONTROL

Contractor Quality Control is the means by which the Contractor ensures that the construction, to include that of subcontractors and suppliers, complies with the requirements of the contract. At least three phases of control must be conducted by the CQC System Manager for each DFW as follows:

3.6.1 Preparatory Phase

This phase must be performed prior to beginning work on each DFW after all required plans/documents/materials are approved/accepted, and after copies are at the work site. This phase includes:

- a. A review of each paragraph of applicable specifications, reference codes, and standards. Make available during the preparatory inspection a copy of those sections of referenced codes and standards applicable to that portion of the work to be accomplished in the field. Maintain and make available in the field for use by Government personnel until final acceptance of the work.
- b. Review of the Contract Drawings.
- c. Check to ensure that all materials and/or equipment have been tested, submitted, and approved.
- d. Review of provisions that have been made to provide required control inspection and testing.
- e. Examination of the work area to ensure that all required preliminary work has been completed and is in compliance with the contract.
- f. Physical examination of required materials, equipment, and sample work to ensure that they are on hand, conform to approved shop drawings or submitted data, and are properly stored.
- g. Review of the appropriate activity hazard analysis to assure safety requirements are met.
- h. Discussion of procedures for controlling quality of the work including repetitive deficiencies. Document construction tolerances and workmanship standards for that feature of work.
- i. Check to ensure that the portion of the plan for the work to be

performed has been accepted by the Contracting Officer.

j. Discussion of the initial control phase.

Notify the Government at least 48 hours in advance of beginning the preparatory control phase meeting. This phase must include a meeting conducted by the CQC System Manager and attended by the Superintendent, other CQC personnel (as applicable), and the foreman responsible for the definable feature. The results of the preparatory phase actions must be documented by separate minutes prepared by the CQC System Manager and attach to the daily CQC report. Instruct applicable workers as to the acceptable level of workmanship required in order to meet contract specifications, including materials, construction methods, workmanship standards, safety considerations and procedures, and preparatory phase meeting minutes.

3.6.2 Initial Phase

This phase is accomplished at the beginning of a DFW. Accomplish the following:

- a. Check work to ensure that it is in full compliance with contract requirements. Review minutes of the preparatory meeting.
- b. Verify adequacy of controls to ensure full contract compliance. Verify required control inspection and testing are in compliance with the contract.
- c. Establish level of workmanship and verify that it meets minimum acceptable workmanship standards. Compare with required sample panels as appropriate.
- d. Resolve all differences.
- e. Check safety to include compliance with and upgrading of the safety plan and AHA. Review the AHA with each worker.
- f. Notify the Government at least 48 hours in advance of beginning the initial phase for a DFW. This phase must include a meeting conducted by the CQC System Manager and attended by the Superintendent, other CQC personnel (as applicable), the foreman responsible for the definable feature and the work crew(s) for the DFW. Separate minutes of this phase must be prepared by the CQC System Manager and attach to the daily CQC report. Indicate the exact location of the initial phase for the DFW for future reference and comparison with follow-up phases.
- g. The initial phase for each DFW is repeated for each new crew to work onsite, or any time acceptable specified quality standards are not being met.

3.6.3 Follow-Up Phase

Perform daily checks to assure control activities, including control testing, are providing continued compliance with contract requirements, until completion of the particular feature of work. Record the checks in the CQC documentation. Conduct final follow-up checks and correct all deficiencies prior to the start of additional features of work which may be affected by the deficient work. Do not build upon nor conceal

non-conforming work.

3.6.4 Additional Preparatory and Initial Phases

Conduct additional preparatory and initial phases on the same DFWs if: the quality of on-going work is unacceptable; if there are changes in the applicable CQC staff, onsite production supervision or work crew; if work on a definable feature is resumed after a substantial period of inactivity; or if other problems develop.

3.6.5 Definable Feature of Work: Definition and Discussion

As discussed in Paragraph 3.2.2, a DFW is a task that is separate and distinct from other tasks and has separate control requirements. A DFW must be sufficiently small so that control of the work (i.e., communication of requirements to workers, inspection of materials and workmanship and correction of deficiencies) will be easily accomplished. Some examples of DFWs include, but are not limited to, the following:

- a. Mobilization for construction activities
- b. Staging area construction and temporary facilities installation
- c. Temporary access road construction
- d. Decontamination area and exclusion zone set up
- e. Groundwater screening
- f. Well installation and development
- g. Amendment injection
- h. Sampling and chemical data acquisition
- i. Site restoration
- j. Waste transportation and disposal

3.6.6 Tracking and Correcting Deficiencies

CQC personnel are responsible for tracking and promptly correcting deficiencies. The "List of Outstanding Deficiencies" form must be used to document deficiencies and be kept current.

3.6.7 Daily CQC Reports

CQC personnel is responsible for preparing daily CQC reports in accordance with Paragraph 3.9. Submit daily CQC reports to the Contracting Officer no more than 24 hours after the date for which they are prepared. Reports must indicate factual evidence of CQC activities including the preparatory meetings, initial phase meetings, and follow-up inspections including location of inspections and deficiencies found, tests performed and results, submittals reviewed, health and safety, etc. The Daily CQC report must also include information from daily safety briefings in accordance with SECTION 01 35 29 - HEALTH, SAFETY, AND EMERGENCY RESPONSE PROCEDURES.

3.7 TESTS

3.7.1 Testing Procedure

Perform specified or required tests to verify that control measures are adequate to provide a product that conforms to contract requirements. Upon request, furnish to the Contracting Officer duplicate samples of test specimens for possible testing by the Government. Testing includes operation and/or acceptance tests when specified. Perform the following activities and record and provide the following data:

- a. Verify that testing procedures comply with contract requirements.
- b. Verify that facilities and testing equipment are available and comply with testing standards.
- c. Check test instrument calibration data against certified standards.
- d. Verify that recording forms and test identification control number system, including all of the test documentation requirements, have been prepared.

Record the results of all tests performed, both passing and failing, on the CQC report for the date performed. Specification paragraph reference, location where tests were performed, and the sequential control number identifying the test will be given. If approved by the Contracting Officer, actual test reports may be submitted later with a reference to the test number and date performed. Provide an informational copy of results of tests performed by an offsite or commercial test facility directly to the Government. Failure to submit timely test reports as stated may result in disapproval of the test facility for this contract.

3.7.2 Testing Laboratories

All testing laboratories must be validated by the USACE Material Testing Center (MTC) for the tests to be performed. Information on the USACE MTC with web-links to both a list of validated testing laboratories and for the laboratory inspection request for can be found at:

<https://mtc.erdcdren.mil/>.

3.7.2.1 Capability Check

The Government reserves the right to check laboratory equipment and calibration in the proposed laboratory for compliance with the standards set forth in the contract specifications and to check the laboratory technician's testing procedures and techniques. Laboratories utilized for testing soils, concrete, asphalt, aggregate, and steel are required to meet criteria detailed in [ASTM D3740](#) and [ASTM E329](#). The Government requires a capability check of the laboratory that the Contractor proposes to perform tests on soils, concrete, asphalt, aggregate and steel.

3.7.3 Onsite Laboratory

The Government reserves the right to utilize the Contractor's control testing laboratory and equipment to make assurance tests and to check the Contractor's testing procedures, techniques, and test results.

3.7.4 Furnishing or Transportation of Samples for Testing

Samples of materials for test verification and acceptance testing by the Government must be delivered to the USACE-designated Quality Assurance (QA) laboratories.

Coordination of each specific test, exact delivery location, and dates must be made through the USEPA-designated QA laboratories. Ensure that sufficient notice is given to USEPA prior to sample delivery.

3.8 COMPLETION INSPECTION

3.8.1 Punch-Out Inspection

An inspection of the work by the CQC System Manager must be conducted near the end of the work, or any increment of the work established by a time stated in FAR 52.211-10 Commencement, Prosecution, and Completion of Work, or by the specifications. Prepare and include in the CQC documentation a punch list of items which do not conform to the approved drawings and specifications, as required by Paragraph 3.9. Include within the list of deficiencies the estimated date by which the deficiencies will be corrected. The CQC System Manager or staff must perform a second inspection to ascertain that all deficiencies have been corrected. Once this is accomplished, notify the Government that the facility is ready for the Government Pre-Final inspection.

3.8.2 Pre-Final Inspection

The Government will perform the pre-final inspection to verify that the facility is complete and ready to be occupied. A Government Pre-Final Punch List may be developed as a result of this inspection. Ensure that all items on this list have been corrected before notifying the Government, so that a Final inspection with the customer can be scheduled. Correct any items noted on the Pre-Final inspection in a timely manner. These inspections and any deficiency corrections required by this paragraph need to be accomplished within the time slated for completion of the entire work or any particular increment of the work if the project is divided into increments by separate completion dates.

3.8.3 Final Acceptance Inspection

The Contractor's Quality Control Inspection personnel, plus the superintendent or other primary management person, and the Contracting Officer's Representative are required to be in attendance at the final acceptance inspection. Additional Government personnel including, but not limited to, those from EPA, State, and local officials may be in attendance. The Final Acceptance Inspection will be formally scheduled by the Contracting Officer based upon results of the Pre-Final inspection. Notify the Contracting Officer at least 14 days prior to the final acceptance inspection and include the Contractor's assurance that all specific items previously identified to the Contractor as being unacceptable, along with all remaining work performed under the Contract, will be complete and acceptable by the date scheduled for the Final Acceptance Inspection.

3.9 DOCUMENTATION

3.9.1 Quality Control Activities

Maintain current records providing factual evidence that required quality control activities and/or tests have been performed. These records include the work of subcontractors and suppliers and must be on the applicable forms, Daily CQC Reports, List of Outstanding Deficiencies, CQC Test Report List, and Record of Preparatory and Initial Inspections that includes, at a minimum, the following information:

- a. Contractor/subcontractor and their area of responsibility.
- b. Operating plant/equipment with hours worked, idle, or down for repair.
- c. Work performed each day, giving location, description, and by whom.
- d. Test and/or control activities performed with results and references to Contract Document requirements. The control phase should be identified (Preparatory, Initial, or Follow-Up). List deficiencies noted along with corrective action.
- e. Quantity of materials received at the Site with statement as to acceptability, storage, and reference to Contract Document requirements.
- f. Submittals and deliverables reviewed, with Contract reference, by whom, and action taken.
- g. Offsite surveillance activities, including actions taken
- h. Job safety evaluations stating what was checked, results, and instructions or corrective actions.
- i. Instructions given/received and conflicts in the Contract Documents.

3.9.2 Verification Statement

Indicate a description of trades working on the project; the number of personnel working; weather conditions encountered; and any delays encountered. Cover both conforming and deficient features and include a statement that equipment and materials incorporated in the work and workmanship comply with the Contract. Furnish the original and one copy of these records in report form to the Government daily within 24 hours after the date(s) covered by the report, except that reports need not be submitted for days on which no work is performed. As a minimum, prepare and submit one report for every 7 days of no work and on the last day of a no work period. All calendar days need to be accounted for throughout the life of the contract. The first report following a day of no work must be for that day only. Reports need to be signed and dated by the CQC System Manager. Include copies of test reports and copies of reports prepared by all subordinate quality control personnel within the CQC System Manager Report.

3.10 REPORTING FORMS

Use the RMS software described in SECTION 01 45 00.15 - RESIDENT MANAGEMENT SYSTEM CONTRACTOR MODE (RMS CM) to produce the basic CQC Reports. Preparatory and Initial Inspections, when performed, must be

indicated on the basic CQC Report and minutes for each inspection must be included. Minutes must consist of a list of specific requirements for materials, procedures or equipment to be employed and must also include any understandings reached or items of special importance discussed.

Produce a list of outstanding deficiencies using the required RMS software and include the list with each CQC Report submittal. As deficiencies are corrected, they are to be acknowledged on the basic CQC Report and must be deleted from the list.

Use the required RMS software to prepare a CQC test report list to track testing to be done as the project progresses, and also to summarize the Contractor's Quality Control testing to be reported on the CQC Plan.

Use the required RMS software to track preparatory and initial inspections as the project progresses and to produce a "Record of Preparatory and Initial Inspections" to summarize these inspections required as part of the CQC Plan.

Additional reporting forms pertaining to specialized activities may be included elsewhere in the contract and must be used for reporting as indicated.

3.11 NOTIFICATION OF NONCOMPLIANCE

The Contracting Officer will notify the Contractor of any detected noncompliance with the foregoing requirements. Take immediate corrective action after receipt of such notice. Such notice, when delivered to the Contractor at the work site, will be deemed sufficient for the purpose of notification. If the Contractor fails or refuses to comply promptly, the Contracting Officer can issue an order stopping all or part of the work until satisfactory corrective action has been taken. Deficiencies cited and verbal instructions given to the Contractor by the Government must be entered into that day's CQC Report.

-- End of Section --

SECTION 01 45 00.15

RESIDENT MANAGEMENT SYSTEM CONTRACTOR MODE (RMS CM)

PART 1 GENERAL

1.1 CONTRACT ADMINISTRATION

The Government will use the Resident Management System (RMS) to assist in its monitoring and administration of this contract. The Government accesses the system using the Government Mode of RMS (RMS GM) and the Contractor accesses the system using the Contractor Mode (RMS CM). The term RMS will be used in the remainder of this section for both RMS GM and RMS CM. The joint Government-Contractor use of RMS facilitates electronic exchange of information and overall management of the contract. The Contractor accesses RMS to record, maintain, input, track, and electronically share information with the Government throughout the contract period in the following areas:

- Administration
- Finances
- Quality Control
- Submittal Monitoring
- Scheduling
- Closeout
- Import/Export of Data

1.1.1 Correspondence and Electronic Communications

For ease and speed of communications, exchange correspondence and other documents in electronic format to the maximum extent feasible. Some correspondence, including pay requests and payrolls, are also to be provided in paper format with original signatures. Paper documents govern, in the event of discrepancy with the electronic version.

1.2 REFERENCES

The publications listed below form a part of this section to the extent referenced. The publications are referred to within the text by the basic designation only. Where reference is made to one of these standards, the revision in effect at the time of contract award applies.

U.S. ARMY CORPS OF ENGINEERS (USACE)

EM 385-1-1

Safety and Health Requirements Manual

1.3 RMS SOFTWARE

RMS is a web based application. Download, install and be able to utilize the latest version of RMS within 7 calendar days of receipt of the task order award. RMS software, user manuals, access and installation instructions, program updates and training information are available from the RMS website (<https://rms.usace.army.mil>). The Government and the Contractor have different access authorities to the same contract database through RMS. The common database will be updated automatically each time a user finalizes an entry or change.

1.4 CONTRACT DATABASE - GOVERNMENT

The Government will enter the basic contract award data in RMS prior to granting the Contractor access. The Government entries into RMS will generally be related to submittal reviews, correspondence status, and Quality Assurance (QA) comments, as well as other miscellaneous administrative information.

1.5 CONTRACT DATABASE - CONTRACTOR

Contractor entries into RMS establish, maintain, and update data throughout the duration of the contract. Contractor entries generally include prime and subcontractor information, daily reports, submittals, Requests for Information (RFI's), schedule updates and payment requests. RMS includes the ability to import attachments and export reports in many of the modules, including submittals. The Contractor responsibilities for entries in RMS typically include the following items:

1.5.1 Administration

1.5.1.1 Contractor Information

Enter all current Contractor administrative data and information into RMS within 7 calendar days of receiving access to the contract in RMS. This includes, but is not limited to, Contractor's name, address, telephone numbers, management staff, and other required items.

1.5.1.2 Subcontractor Information

Enter all subcontractor administrative data and information into RMS CM within 7 calendar days of receiving access to the contract in RMS or within 7 calendar days of the signing of the subcontractor agreement for agreements signed at a later date. This includes name, trade, address, phone numbers, and other required information for all subcontractors. A subcontractor is listed separately for each trade to be performed.

1.5.1.3 Correspondence

Identify all Contractor correspondence to the Government with a serial number. Prefix correspondence initiated by the Contractor's site office with "S". Prefix letters initiated by the Contractor's home (main) office with "H". Letters are numbered starting from 0001, (e.g., H-0001 or S-0001). The Government's letters to the Contractor will be prefixed with "C" or "RFP".

1.5.1.4 Equipment

Enter and maintain a current list of equipment planned for use or being used on the jobsite, including the most recent and planned equipment inspection dates.

1.5.1.5 Reports

Track the status of the project utilizing the reports available in RMS. The value of these reports is reflective of the quality of the data input. These reports include the QC comments, Submittal Register Status, and Three-Phase Control worksheets.

1.5.1.6 Request For Information (RFI)

Create and track all RFI in the RMS Administration Module for Government review and response.

1.5.2 Quality Control

Enter and track implementation of the 3-phase QC Control System, QC testing, transferred and installed property and warranties in RMS. Prepare daily reports, identify and track deficiencies, document progress of work, and support other Contractor QC requirements in RMS. Maintain all data on a daily basis. Ensure that RMS reflects all quality control methods, tests and actions contained within the Contractor Quality Control (CQC) Plan and Government review comments of same within 7 calendar days of Government acceptance of the CQC Plan.

1.5.2.1 Quality Control Reports

The Contractor's QC Daily Report in RMS is the official report. The Contractor can use other supplemental formats to record QC data, but information from any supplemental formats are to be consolidated and entered into the RMS QC Daily Report. Any supplemental information may be entered into RMS as an attachment to the report. Finalize and sign QC Daily Reports into RMS within 24 hours after the date covered by the report. Provide the Government a printed signed copy of the QC Daily Report, unless waived by the Contracting Officer.

1.5.2.2 Deficiency Tracking

Use the QC Daily Report Module to enter and track deficiencies. Deficiencies identified and entered into RMS by the Contractor or the Government must be sequentially numbered with a QC or QA prefix for tracking purposes. Enter each deficiency into RMS the same day that the deficiency is identified. Monitor, track and resolve all QC and QA entered deficiencies. A deficiency is not considered to be corrected until the Government indicates concurrence in RMS.

1.5.2.3 Three-Phase Control Meetings

Maintain scheduled and actual dates and times of preparatory and initial control meetings in RMS. Worksheets for the three-phase control meetings are generated within RMS.

1.5.2.4 Labor and Equipment Hours

Enter labor and equipment exposure hours on a daily basis. Roll up the labor and equipment exposure data into a monthly exposure report.

1.5.2.5 Accident/Safety Reporting

Both the Contractor and the Government enter safety related comments in RMS as a deficiency. Monitor, track and show resolution for safety issues in the QC Daily Report area of the RMS QC Module. In addition, follow all reporting requirements for accidents and incidents as required in EM 385-1-1, SECTION 01 35 29 - HEALTH, SAFETY, AND EMERGENCY RESPONSE PROCEDURES and as required by any other applicable Federal, State or local agencies.

1.5.2.6 Definable Features of Work

Enter each DFW, as defined in the approved CQC Plan, into the RMS QC Module. A DFW may be associated with a single or multiple pay activities, however a pay activity is only to be linked to a single DFW.

1.5.2.7 Activity Hazard Analysis

Import AHA electronic document files into the RMS QC Module utilizing the document package manager.

1.5.3 Submittal Management

Enter all current submittal register data and information into RMS within 7 calendar days of receiving access to the contract in RMS. The information shown on the submittal register following the specification SECTION 01 33 00 - SUBMITTAL PROCEDURES will already be entered into the RMS database when access is granted. Group electronic submittal documents into transmittal packages to send to the Government, except very large electronic files, samples, spare parts, mock ups, color boards, or where hard copies are specifically required. Track transmittals and update the submittal register in RMS on a daily basis throughout the duration of the contract. Submit hard copies of all submittals unless waived by the Contracting Officer.

1.5.4 Schedule

Enter and update the contract project schedule in RMS by either manually entering all schedule data or by importing the Standard Data Exchange Format (SDEF) file, based on the requirements in SECTION 01 32 01.00 10 - PROJECT SCHEDULE.

1.5.5 Closeout

Closeout documents, processes and forms are managed and tracked in RMS by both the Contractor and the Government. Ensure that all closeout documents are entered, completed and documented within RMS.

1.6 IMPLEMENTATION

Use of RMS as described in the preceding paragraphs is mandatory. Ensure that sufficient resources are available to maintain contract data within the RMS system. RMS is an integral part of the Contractor's required management of quality control.

1.7 NOTIFICATION OF NONCOMPLIANCE

Take corrective action within 7 calendar days after receipt of notice of RMS non-compliance by the Contracting Officer.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

-- End of Section --

SECTION 01 50 00

TEMPORARY CONSTRUCTION FACILITIES AND UTILITIES

PART 1 GENERAL

1.1 SCOPE OF WORK

Furnish temporary construction facilities of the size and performance requirements specified herein.

Budget for potentially obtaining office items (such as desks, chairs, tables, printers, copiers, fax machines, bulletin board, filing cabinets, etc.) from other USACE/EPA Sites. Coordinate furniture/equipment procurement with USACE prior to purchase.

Do not procure office equipment until a thorough review of the Government's inventory of available equipment is performed with the Government.

Facilities consist of the following:

- a. USACE/EPA field office
- b. Safety, security, communications, and Contractor's offices
- c. Emergency medical facility (within Contractor's office trailer)
- d. Personnel hygiene and decontamination facilities
- e. Lunch break area
- f. Equipment storage
- g. Onsite contaminated equipment area
- h. Parking area
- i. Traffic provisions

Facilities may be combined to decrease number of trailers within the staging area. Propose number and layout of trailers and get approval from Contracting Officer before proceeding with trailer mobilization.

1.2 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only. Where reference is made to one of these standards, the revision in effect at the time of contract award applies.

NEW JERSEY DEPARTMENT OF TRANSPORTATION (NJDOT)

BDC15MR-01

NJDOT Roadway Design Manual Traffic
Control Plans and Details

U.S. ARMY CORPS OF ENGINEERS (USACE)

EM 385-1-1 Safety and Health Requirements Manual

U.S. DEPARTMENT OF TRANSPORTATION (DOT)

23 CFR 655F Traffic Control Devices on Federal-Aid and
Other Streets and Highways

MUTCD Manual on Uniform Traffic Control Devices

AMERICAN NATIONAL STANDARDS INSTITUTE/ NATIONAL ASSOCIATION OF
ARCHITECTURAL METAL MANUFACTURERS

FP 1001-97 Guide Specifications for Design of Metal
Flagpoles

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 70 National Electrical Code

NFPA 241 Standard for Safeguarding Construction,
Alteration, and Demolition Operations

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

ANSI Z308.1 Minimum Requirements for Workplace First
Aid Kits and Supplies

OCCUPATIONAL SAFETY & HEALTH ADMINISTRATION (OSHA)

1910.151.b Medical services and first aid.

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals with an "FIO" designation are for information only. Submit the following to the Contracting Officer in accordance with SECTION 01 33 00 - SUBMITTAL PROCEDURES.

SD-01 Preconstruction Submittals

Temporary Site Facility Layout Plan; G

Submit the Temporary Site Facility Layout Plan to the Government for approval at least 14 calendar days prior to the Pre-Work Conference and no later than 30 days after the task order award. At a minimum, the Contractor's Site Layout drawing must include the following information:

- a. General layouts of temporary facilities including trailers, shower trailers, equipment storage areas (onsite and offsite), decontamination areas and pads, parking areas, access and haul roads, avenues of ingress/egress to the sites, and details of fence installation. A total of three trailers are anticipated.
- b. Electrical Supply and Lighting Shop Drawings.

- c. Water Supply, Contaminated Washwater Handling and Sanitary Facilities.
- d. Identify any areas which may have to be graveled or covered with construction mats to prevent the tracking of mud.
- e. Indicate if the use of a supplemental or other staging areas are desired.

Traffic Control Plan; G

Prior to the commencement of construction operations, submit for approval a Traffic Control Plan, detailing the proposed traffic control details for the maintenance of traffic around the site in accordance with Paragraph 3.5.

Contractor Computer Cybersecurity Compliance Statements; G

Provide Contractor Computer Cybersecurity Compliance Statements in accordance with Paragraph 1.7.1.4.

Contractor Temporary Network Cybersecurity Compliance Statements; G

Provide Contractor Temporary Network Cybersecurity Compliance Statements in accordance with Paragraph 1.7.6.

Permit Equivalencies and Approvals; FIO

Submit copies of permit equivalencies and approvals for construction as required by Paragraph 1.5.

1.4 USACE CONDITION OF READINESS (COR)

USACE will set the Condition of Readiness (COR) based on the weather forecast for sustained winds 50 knots (58mph) or greater. Contact the Contracting Officer for the current COR setting. Monitor weather conditions a minimum of twice a day and take appropriate actions according to the approved Emergency Plan in the accepted Accident Prevention Plan, [EM 385-1-1](#) Section 01 Emergency Planning and the instructions below.

Unless otherwise directed by the Contracting Officer, comply with:

- a. Condition FOUR (Sustained winds of 58 mph or greater expected within 72 hours): Normal daily jobsite cleanup and good housekeeping practices. Collect and store in piles or containers scrap lumber, waste material, and rubbish for removal and disposal at the close of each work day. Maintain the construction site including storage areas, free of accumulation of debris. Stack form lumber in neat piles less than 3.3 feet high. Remove all debris, trash, or objects that could become missile hazards. Review requirements pertaining to "Condition THREE" and continue action as necessary to attain "Condition FOUR" readiness. Contact the Contracting Officer for weather and COR updates and completion of required actions.
- b. Condition THREE (Sustained winds of 58 mph or greater expected within 48 hours): Maintain "Condition FOUR" requirements and commence securing operations necessary for "Condition ONE" which cannot be completed within 18 hours. Cease all routine activities which might interfere with securing operations. Commence securing and stow all

gear and portable equipment. Make preparations for securing buildings. Reinforce or remove formwork and scaffolding. Secure or remove machinery, tools, equipment, and materials from the jobsite. Expend every effort to clear all missile hazards and loose equipment from general base areas. Contact the Contracting Officer for weather and COR updates and completion of required actions. Review requirements pertaining to "Condition TWO" and continue action as necessary to attain "Condition THREE" readiness.

- c. Condition TWO (Sustained winds of 58 mph or greater expected within 24 hours): Secure the jobsite, and leave Government premises.
- d. Condition ONE. (Sustained winds of 58 mph or greater expected within 12 hours): Contractor access to the jobsite and Government premises is prohibited.

1.5 REGULATORY REQUIREMENTS

Obtain all necessary construction, building, and zoning permits required by local authorities.

Provide notification to the Government regarding all permits required by the local authorities prior to pursuing and obtaining such permits. Permits and approvals from local regulatory agencies are summarized in SECTION 01 11 00 - SUMMARY OF WORK.

Comply with all applicable federal, state, city and local the laws, ordinances, codes, rules, and regulations governing the installation of temporary facilities and utilities.

1.6 MINIMIZE ACCUMULATION OF INVENTORY

During the contract period, minimize the accumulation of government inventory to prevent a build-up of inventory the Government must manage at the end of the contract.

1.7 CYBERSECURITY DURING CONSTRUCTION

Meet the following requirements throughout the construction process.

1.7.1 Contractor Computer Equipment

Contractor owned computers may be used for construction. When used, contractor computers must meet the following requirements:

1.7.1.1 Operating System

The operating system must be an operating system currently supported by the manufacturer of the operating system. The operating system must be current on security patches and operating system manufacturer required updates.

1.7.1.2 Anti-Malware Software

The computer must run anti-malware software from a reputable software manufacturer. Anti-malware software must be a version currently supported by the software manufacturer, must be current on all patches and updates, and must use the latest definitions file. Scan all computers used on this project using the installed software at least once per day.

1.7.1.3 Passwords and Passphrases

Change the passwords and passphrases for all computers from their default values. Passwords must be a minimum of eight characters with a minimum of one uppercase letter, one lowercase letter, one number and one special character.

1.7.1.4 Contractor Computer Cybersecurity Compliance Statements

Provide a single submittal containing completed Contractor Computer Cybersecurity Compliance Statements for each company using contractor owned computers. Contractor Computer Cybersecurity Compliance Statements must use the template published at <http://www.wbdg.org/ffc/dod/unified-facilities-guide-specifications-ufgs/forms-graphics-tables> and attached at the end of this section. Each Statement must be signed by a cybersecurity representative for the relevant company.

1.7.2 Temporary Internet Protocol (IP) Networks

Temporary contractor-installed IP networks may be used during construction. When used, temporary contractor-installed IP networks must meet the following requirements:

1.7.2.1 Network Boundaries and Connections

The network must not extend outside the project site and must not connect to any IP network other than IP networks provided under this project or Government furnished IP networks provided for this purpose. Any and all network access from outside the project site is prohibited.

1.7.3 Government Access to Network

Allow Government personnel to have complete and immediate access to the network at any time in order to verify compliance with this specification.

1.7.4 Temporary Wireless IP Networks

In addition to the other requirements on temporary IP networks, temporary wireless IP (WiFi) networks must not interfere with existing wireless network and must use WPA2 security. Change network names (SSID) for wireless networks from their default values.

1.7.5 Passwords and Passphrases

Change the passwords and passphrases for all network devices and network access from their default values. Passwords must be a minimum 8 characters with a minimum of one uppercase letter, one lowercase letter, one number and one special character.

1.7.6 Contractor Temporary Network Cybersecurity Compliance Statements

Provide a single submittal containing completed Contractor Temporary Network Cybersecurity Compliance Statements for each company implementing a temporary IP network. Contractor Temporary Network Cybersecurity Compliance Statements must use the template published at <http://www.wbdg.org/ffc/dod/unified-facilities-guide-specifications-ufgs/forms-graphics-tables> and attached at the end of this section. Each Statement must be signed by a cybersecurity representative for the

relevant company. If no temporary IP networks will be used, provide a single copy of the Statement indicating this.

PART 2 PRODUCTS

2.1 GENERAL

Provide all structures other than storage sheds installed under this section with, at a minimum, the following services:

- a. Lighting. Electric light, non-glare type luminaries to provide a minimum illumination level of 50 footcandles at desk height level.
- b. Heating and Cooling. Adequate equipment to maintain an ambient air temperature of 70 degrees Fahrenheit (F) \pm 3 degrees.
- c. Potable bottled water.
- d. Fire Extinguisher. Non-toxic, dry chemical fire extinguisher with a minimum rating of 2A: 10B: 10C.
- e. First Aid Kit. At a minimum, the first aid kit must include antiseptic kit, eyewash solution, bandages, insect sting medication, aspirin and acetaminophen, and cold pack.
- f. Automated external defibrillator approved by the United States Food and Drug Administration.
- g. Janitorial services on a daily basis including but not limited to sweeping, emptying wastebaskets/recycling bins, servicing of toilets, weekly mopping of floors, sanitizing toilet seats, providing towels and soap to the lavatories and monthly washing of floors and windows (inside and out). Coordinate the time of the cleaning with the Government.
- h. Sufficient supply of electrical outlets.

Provide all parking areas with adequate outdoor lighting as specified herein.

Design all structures and facilities for year-round operation.

Trailers must be roadworthy and comply with all appropriate state and local vehicle requirements. Trailers which are rusted, have peeling paint or are otherwise in need of repair will not be allowed on Installation property. Trailers must present a clean and neat exterior appearance and be in a state of good repair.

2.2 TEMPORARY SIGNAGE

2.2.1 Bulletin Board

Within 14 calendar days of mobilization on site and prior to commencement of field activities, provide a clear weatherproof covered bulletin board not less than 36 inches by 48 inches in size for displaying the Equal Employment Opportunity poster, a copy of the wage decision contained in the contract, Wage Rate Information poster, Safety and Health Information as required by EM 385-1-1 Section 01 and other information approved by the Contracting Officer. Locate the bulletin board at the project site in a

conspicuous place easily accessible to all employees, and in location as approved by the Contracting Officer.

2.2.2 Project Identification Signs

The requirements for the signs, their content, and location are as specified in Section 01 58 00 - PROJECT IDENTIFICATION. Erect signs within 15 days after receipt of the task order award. Correct the data required by the safety sign daily, with light colored metallic or non-metallic numerals.

2.2.3 Warning Signs

Post temporary signs, tags, and labels to give workers and the public adequate warning and caution of construction hazards according to the EM 385-1-1 Section 04. Attach signs to the perimeter fencing every 150 feet warning the public of the presence of construction hazards. Signs must require unauthorized persons to keep out of the construction site. Correct the data required by safety signs daily. Post signs at all points of entry designating the construction site as a hard hat area.

2.3 TEMPORARY TRAFFIC CONTROLS

All traffic control devices must conform to MUTCD.

2.3.1 Access Roads

Construct access roads necessary for proper prosecution of the work under this Contract in accordance with EM 385-1-1 Section 04. Construct with suitable grades and widths; avoid sharp curves, blind corners, and dangerous cross traffic. Submit haul road plan with the Traffic Control Plan for approval. Provide necessary lighting, signs, barricades, and distinctive markings for the safe movement of traffic. The method of dust control, although optional, must be adequate to ensure safe operation at all times. Location, grade, width, and alignment of construction and haul roads are subject to approval by the Contracting Officer. Lighting must be adequate to assure full and clear visibility for full width of haul road and work areas during any night work operations.

2.3.2 Barricades

Erect and maintain temporary barricades to limit public access to hazardous areas. Barricades are required whenever safe public access to paved areas such as roads, parking areas, or sidewalks is prevented by construction activities or as otherwise necessary to ensure the safety of both pedestrian and vehicular traffic. Securely place barricades clearly visible with adequate illumination to provide sufficient visual warning of the hazard during both day and night.

2.4 TEMPORARY WIRING

Provide temporary wiring in accordance with EM 385-1-1 Section 11, NFPA 241 and NFPA 70. Include monthly inspection and testing of all equipment and apparatus.

2.5 USACE AND EPA FIELD OFFICE

Furnish at the job site, prior to the start of work, a minimum 8-foot by 28-foot field office for use by USACE and EPA for the duration of the

contract. Field office and contents will remain the property of the Contractor. The exact location will be designated by the Contracting Officer. The office trailer must be well constructed and properly ventilated and contain a closet, door, and windows capable of being locked. Outfit the office trailer with office furniture and items, as directed by the Government, from other USACE/EPA sites. Provide adequate electric lighting, a minimum of six duplex electrical receptacles, drinking water, heat, toilet facilities, air conditioning, janitorial services and maintenance services. In addition, make arrangements and pay connection fees and monthly usage charges for electrical service, two telephone lines, one dedicated fax line, and internet service. Provide and pay for a teleconferencing phone number for participants to call into the weekly construction meetings or any additional meetings requested by the Government. Remove the field office from the project site when and as directed by the Contracting Officer.

The office trailer must have at least one office, one restroom, and two exterior doors. The Contractor must provide the following furnishings for the UASACE and EPA temporary field office for the duration of the project. All furnishings must be new or in very good condition, subject to approval of the Contracting Officer.

- a. Two 60-in by 30-in desks with lockable file drawer
- b. One 72-in by 30-in folding table
- c. Six folding chairs
- d. Two file cabinets, 2 drawer, legal size, Hon 310 Series, or equal
- e. Two wastebaskets
- f. One wall-mounted first aid kit, OSHA (1910.151.b) and (ANSI Z308.1) compliant, suitable for ten people
- g. Two 8-outlet surge protectors with six-foot cord and minimum 1800-joule energy rating or greater.

Provide the following supplies for the duration of the project: toilet paper, paper towels, soap, light bulbs, and other consumables as required by the Government's field representative.

2.6 SAFETY, SECURITY, COMMUNICATIONS, AND CONTRACTOR'S OFFICES

Provide a partitioned area for safety, security and communications personnel. This area must contain, at a minimum, the following equipment:

- a. Two (2) office desks with lockable drawers, and three (3) office chairs.
- b. One (1) telephone.
- c. One (1) office table.
- d. Two (2) lockable, fire-resistant, four-drawer filing cabinets.
- e. A minimum of two (2) windows providing visibility of the Site.
- f. One (1) base and six (6) portable two-way radios. All sets must be

intrinsically safe, and capable of transmitting to and receiving from any other set at any point within the Site and areas within the influence of the work. All portable units must be rechargeable, and must be capable of operating continuously without recharge for three hours.

Provide a partitioned office for the use of the Contractor. The office must contain at least two operable windows with screens and must be supplied with the following equipment:

- a. One (1) office desk with lockable drawers and chair.
- b. One (1) telephone.
- c. One (1) fire-resistant, four-drawer, lockable filing cabinet.

2.7 EMERGENCY MEDICAL FACILITY

The emergency medical facility must contain, at a minimum, first aid medications appropriate for the initial treatment of burns, abrasions, fractures, and ingestion or dermal contact with onsite hazardous waste.

2.8 PERSONNEL HYGIENE FACILITIES

Provide the equipment and fixtures specified below in order to provide for the proper hygiene of all onsite personnel.

- a. Locker room for onsite personnel.
- b. An area where all personnel safety equipment and protective clothing can be stored.
- c. Toilet facilities with at least one toilet and sink for every six onsite personnel of each sex.
- d. Sanitary waste holding tank and piping from Personnel Hygiene Facility and site offices.
- e. Properly supply and maintain all equipment and fixtures in a clean condition. Convey drain water from all washing facilities to an onsite holding tank for subsequent disposal at an approved sewage receiving facility.

2.9 LUNCH BREAK AREA

Provide a separate, uncontaminated lunch area of sufficient size for all Contractor onsite personnel. Such an area may be combined with the emergency medical facility as. Furnish all the furniture required in the lunch room to accommodate the maximum number of Contractor personnel working on any single day.

2.10 EQUIPMENT STORAGE

Provide a separate or partitioned equipment storage area which must have access through a lockable door. The area for equipment storage must not be less than 96 square feet. Sufficient shelving must be installed for storage and inventory control of small items. In addition, this area must contain one four-drawer lockable filing cabinet and a wooden lockable locker sufficient for the storage of surveying and testing instruments.

2.11 ONSITE CONTAMINATED EQUIPMENT AREA

Provide an onsite contaminated equipment storage area at the entrance point to each Contamination Reduction Zone facility area (lined with polyethylene). Equipment and personnel decontamination facility specifications are included in SECTION 01 35 29 - HEALTH, SAFETY, AND EMERGENCY RESPONSE PROCEDURES.

Each contaminated equipment storage area must include but not necessarily be limited to the following:

- a. Boot rack for washing and storage.
- b. Drums for the disposal of protective clothing.
- c. A 10-foot by 10-foot temporary structure for the storage of contaminated materials with equipment used daily.
- d. Emergency eyewash and shower and fire extinguisher.

2.12 PARKING

2.12.1 Employee Parking

Construction contractor employees must park privately owned vehicles in an area designated by the Contracting Officer. This area will be within reasonable walking distance of the site. Employee parking must not interfere with existing and established parking requirements of the Government installation.

2.12.2 Government Parking

Reserve at least five parking spaces for the use of the Government and its visitors.

2.13 OUTDOOR LIGHTING

Determine the extent of existing outdoor lighting within the Support Zone. If there is no lighting or existing lighting does not meet the requirements below, furnish and install a complete operating outdoor lighting system throughout the designated Support Zone.

The lighting system must include wood-pole-mounted 400-watt high-pressure sodium luminaries supported on 4-foot steel arms with 30-foot mounting height above grade. Provide one pole at or adjacent to the Support Zone. The system must include all equipment and materials (such as transformers and circuit protective devices) and conductors.

Submit shop drawings showing the layout, equipment and material details, and circuits prior to furnishing the equipment.

2.14 SANITARY WASTE SYSTEM

Provide a sanitary waste system for the USACE and EPA trailer and pay monthly usage charges for the contract duration. Onsite sanitary facilities must consist of chemical type toilets. No toilet facilities may be provided in the Exclusion Zones. Provide a portable wash unit and collection system for the Equipment Decontamination Facility, hand

washing, and as specified elsewhere.

2.15 FLAG POLES

Provide two 20-foot aluminum flag poles meeting the American National Standards Institute/National Association of Architectural Metal Manufacturers (ANSI/NAAMM) [FP 1001-97](#), Guide Specifications for Design of Metal Flagpoles or equal and all of the standard hardware to fly the U.S. Flag and U.S. Army Corps of Engineers Flag. The flag poles must be installed in the Support Zone at a location to be determined by the Government.

2.16 TEMPORARY FENCE

The fence MUST be 6-feet high with No. 9 gauge galvanized wire woven in 2-in diamond mesh with top and bottom twisted selvage. Intermediate and terminal posts shall be galvanized steel H or pipe, minimum 2-3/8-in OD line posts, 2-7/8-in OD corner and pull posts, and 1-5/8-in OD top rails.

PART 3 EXECUTION

3.1 LOCATION

Utilize the Contractor's Support Zone in the approved Temporary Site Facility Layout Plan for all temporary facilities. Use of areas outside the Contractor's Support Zone must be pre-approved by the Government. Install all offices plumb and level.

3.2 MAINTENANCE

Maintain all temporary construction facilities and perform all necessary repairs, replacement, cleaning and any other maintenance required as directed by the Government. Sweeping and any other cleaning necessary to keep the facilities free of soil, dust, and debris must be included in this maintenance. Failure to do so will be sufficient reason to require removal of the temporary facilities.

3.3 TEMPORARY BULLETIN BOARD

Locate the bulletin board at the project site in a conspicuous place easily accessible to all employees, as approved by the Contracting Officer.

3.4 AVAILABILITY AND USE OF UTILITY SERVICES

3.4.1 Temporary Utilities

Provide temporary utilities required for construction. Materials may be new or used, must be adequate for the required usage, not create unsafe conditions, and not violate applicable codes and standards.

3.4.2 Meters and Temporary Connections

Provide and maintain necessary temporary connections and meter bases required to measure the amount of each utility used for the purpose of determining charges.

3.4.3 Electrical Work

Experienced electricians under the general supervision and control of a

State, City, or County licensed electrician with verifiable credentials must perform all electrical work. Provide proof of licensing of supervising electricians to the Contracting Officer with the Temporary Site Facility Layout Plan.

3.5 TRAFFIC PROVISIONS

3.5.1 General

Provide traffic control during RA construction activities at the entrance to the site, and as otherwise necessary to meet the local requirements.

Coordinate with, notify, and obtain written approval from City of Newark and all local emergency response authorities (police, fire, etc.) prior to commencement of remedial activities or restricting traffic on any roads.

Conduct construction operations in such a manner as to offer the least possible obstruction to the safe and satisfactory movement of traffic over the existing roads during the life of the contract.

The Contractor is responsible for providing, erecting, maintaining, and removal of all traffic signs, barricades, and other traffic control devices necessary for maintenance of traffic.

3.5.2 Maintenance of Traffic

- a. Conduct operations in a manner that will not close a thoroughfare or interfere with traffic on railways or highways except with written permission of the Contracting Officer at least 15 calendar days prior to the proposed modification date, and provide a Traffic Control Plan for Government approval detailing the proposed controls to traffic movement for approval. The plan must be in accordance with the **MUTCD**, Part VI, **23 CFR 655F**, and State and local regulations including **BDC15MR-01**. The Contractor may move oversized and slow-moving vehicles to the worksite provided requirements of the highway authority have been met.
- b. Conduct work so as to minimize obstruction of traffic, and maintain traffic on at least half of the roadway width at all times. Obtain approval from the Contracting Officer prior to starting any activity that will obstruct traffic.
- c. Provide, erect, and maintain lights, barriers, signals, passageways, detours, and other items, that may be required by the Life Safety Signage, overhead protection authority having jurisdiction.
- d. Provide cones, signs, barricades, lights, or other traffic control devices and personnel required to control traffic. Do not use foil-backed material for temporary pavement marking because of its potential to conduct electricity during accidents involving downed power lines.

3.5.3 Protection of Traffic

Maintain and protect traffic on all affected roads during the construction period except as otherwise specifically directed by the Contracting Officer. Minimize the interference with public traffic on roads selected for hauling material to and from the site. Investigate the adequacy of existing roads and their allowable load limit. The Contractor is

responsible for the repair of damage to roads caused by construction operations.

3.5.4 Rush Hour Restrictions

Do not interfere with the peak traffic flows preceding and during normal operations without notification to and approval by the Contracting Officer.

3.5.5 Dust Control

Dust control methods and procedures must be approved by the Contracting Officer. Coordinate dust control methods with SECTION 01 57 19 - TEMPORARY ENVIRONMENTAL CONTROLS.

3.6 SITE COMMUNICATIONS

Whenever the individual elements of the Site are located so that operation by normal voice between these elements is not satisfactory, install a satisfactory means of communication, such as telephone or other suitable devices and make available for use by Government personnel.

3.7 CLEANUP

Remove construction debris, waste materials, packaging material and the like from the work site daily.

Any dirt or mud which is tracked onto paved or surfaced roadways must be cleaned away.

3.8 RESTORATION OF STORAGE AREA

Upon completion of the project remove the bulletin board, signs, barricades, all traffic control devices, haul roads, and all other temporary products from the site. After removal of trailers, materials, and equipment from within the fenced area, remove the fence. Restore areas used during the performance of the Contract to the original or better condition in accordance with SECTION 32 00 00 - SITE RESTORATION and the Contract Drawings. Remove gravel used to traverse grassed areas and restore the area to its original condition, including top soil and seeding as necessary.

PART 4 ATTACHMENTS

1. Contractor Computer Cybersecurity Compliance Statement Template
2. Contractor Temporary Network Cybersecurity Compliance Statement Template

-- End of Section --

Contractor Computer Cybersecurity Compliance Statement

Number of contractor-owned computers used during construction: _____

For each contractor-owned computer, list the make and model of the device, the device serial number, the operating system version, and the anti-malware software version. Attach additional sheets if required to document all computers.

Number of additional sheets attached: _____

	Make/Model	Serial Number(s)	Operating System Type and Version	Anti-Malware Software Type and Version
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				

I hereby certify that:

- The information provided above is accurate as of the date this document is signed
- All computers listed will be provided any and all patches and updates released during the period of construction
- The computers listed above will be scanned by Anti-Malware software at least once per day during the period of construction.
- Passwords for computers have been changed from defaults

Signature: _____

Date: _____

Completed By:

Name: _____

Position Title: _____

Company: _____

Contractor Temporary Network Cybersecurity Compliance Statement

Check ONE: Temporary IP networks (___) WILL or (___) WILL NOT be used

Check ONE: Temporary Wireless IP networks (___) WILL or (___) WILL NOT be used

I hereby certify that:

- Temporary IP networks will not connect to any other IP network.
- Temporary IP networks will not extend outside the project site.
- Temporary Wireless IP networks will use WPA2 encryption.
- There will be NO off-site access of any kind to temporary networks.
- Passwords for network hardware and network access have been changed from defaults.

Signature: _____

Date: _____

Completed By:

Name: _____

Position Title: _____

Company: _____

SECTION 01 57 19

TEMPORARY ENVIRONMENTAL CONTROLS

PART 1 GENERAL

1.1 SCOPE OF WORK

Furnish all labor, materials, equipment, and incidentals necessary to meet requirements for protection of the human and natural environment during construction activities specified in the Contract Documents. This includes furnishing all labor, materials, equipment and incidentals required to provide environmental pollution and damage control.

1.2 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only. Where reference is made to one of these standards, the revision in effect at the time of contract award applies.

U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)

29 CFR 1910.120	Hazardous Waste Operations and Emergency Response
40 CFR 112	Oil Pollution Prevention
40 CFR 152 - 186	Pesticide Programs
40 CFR 241	Guidelines for Disposal of Solid Waste
40 CFR 243	Guidelines for the Storage and Collection of Residential, Commercial, and Institutional Solid Waste
40 CFR 258	Subtitle D Landfill Requirements
40 CFR 260	Hazardous Waste Management System: General
40 CFR 261	Identification and Listing of Hazardous Waste
40 CFR 263	Standards Applicable to Transporters of Hazardous Waste
40 CFR 273	Standards for Universal Waste Management
40 CFR 273.2	Standards for Universal Waste Management - Batteries
40 CFR 273.3	Standards for Universal Waste Management - Pesticides
40 CFR 273.4	Standards for Universal Waste Management - Mercury Containing Equipment

White Chemical Corporation Superfund Site, OU3
Final 100% Remedial Design

40 CFR 273.5	Standards for Universal Waste Management - Lamps
40 CFR 279	Standards for the Management of Used Oil
40 CFR 300	National Oil and Hazardous Substances Pollution Contingency Plan
40 CFR 300.125	National Oil and Hazardous Substances Pollution Contingency Plan - Notification and Communications
40 CFR 302	Designation, Reportable Quantities, and Notification
40 CFR 355	Emergency Planning and Notification
40 CFR 50	National Primary and Secondary Ambient Air Quality Standards
40 CFR 60	Standards of Performance for New Stationary Sources
40 CFR 63	National Emission Standards for Hazardous Air Pollutants for Source Categories
40 CFR 64	Compliance Assurance Monitoring
40 CFR 260	Hazardous Waste Management System: General
40 CFR 261	Identification and Listing of Hazardous Waste
40 CFR 262	Standards Applicable to Generators of Hazardous Waste
FAR 52.236-7	Permits and Responsibilities
49 CFR 171	General Information, Regulations, and Definitions
49 CFR 172	Hazardous Materials Table, Special Provisions, Hazardous Materials Communications, Emergency Response Information, and Training Requirements
49 CFR 173	Shippers - General Requirements for Shipments and Packagings

U.S. ARMY CORPS OF ENGINEERS (USACE)

EM 385-1-1	Safety and Health Requirements Manual
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NEW JERSEY DEPARTMENT OF TRANSPORTATION (NJDOT)

Section 802	Standard Specification for Road and Bridge Construction, Section 802
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1.3 DEFINITIONS

1.3.1 Class I and II Ozone Depleting Substance (ODS)

Class I ODS is defined in Section 602(a) of The Clean Air Act. A list of Class I ODS can be found on the EPA website at the following weblink.

<https://www.epa.gov/ozone-layer-protection/ozone-depleting-substances>.

Class II ODS is defined in Section 602(s) of The Clean Air Act. A list of Class II ODS can be found on the EPA website at the following weblink.

<https://www.epa.gov/ozone-layer-protection/ozone-depleting-substances>.

1.3.2 Contractor Generated Hazardous Waste

Contractor generated hazardous waste is materials that, if abandoned or disposed of, may meet the definition of a hazardous waste. These waste streams would typically consist of material brought on site by the Contractor to execute work but are not fully consumed during the course of construction. Examples include, but are not limited to, excess paint thinners (i.e., methyl ethyl ketone, toluene), waste thinners, excess paints, excess solvents, waste solvents, excess pesticides, and contaminated pesticide equipment rinse water.

1.3.3 Electronics Waste

Electronics waste is discarded electronic devices intended for salvage, recycling, or disposal.

1.3.4 Environmental Pollution and Damage

Environmental pollution and damage is the presence of chemical, physical, or biological elements or agents which adversely affect human health or welfare; unfavorably alter ecological balances of importance to human life; affect other species of importance to humankind; or degrade the environment aesthetically, culturally or historically.

1.3.5 Environmental Protection

Environmental protection is the prevention/control of pollution and habitat disruption that may occur to the environment during construction. The control of environmental pollution and damage requires consideration of land, water, and air; biological and cultural resources; and includes management of visual aesthetics; noise; solid, chemical, gaseous, and liquid waste; radiant energy and radioactive material as well as other pollutants.

1.3.6 Hazardous Debris

As defined in paragraph SOLID WASTE, hazardous debris is debris that contains listed hazardous waste (either on the debris surface, or in its interstices, such as pore structure) in accordance with 40 CFR 261. Hazardous debris also includes debris that exhibits a characteristic of hazardous waste in accordance with 40 CFR 261.

1.3.7 Hazardous Materials

Hazardous materials as defined in 49 CFR 171 and listed in 49 CFR 172.

Hazardous material is any material that: Is regulated as a hazardous

material in accordance with 49 CFR 173; or requires a Safety Data Sheet (SDS) in accordance with 29 CFR 1910.120; or during end use, treatment, handling, packaging, storage, transportation, or disposal meets or has components that meet or have potential to meet the definition of a hazardous waste as defined by 40 CFR 261 Subparts A, B, C, or D. Designation of a material by this definition, when separately regulated or controlled by other sections or directives, does not eliminate the need for adherence to that hazard-specific guidance which takes precedence over this section for "control" purposes. Such material includes ammunition, weapons, explosive actuated devices, propellants, pyrotechnics, chemical and biological warfare materials, medical and pharmaceutical supplies, medical waste and infectious materials, bulk fuels, radioactive materials, and other materials such as asbestos, mercury, and polychlorinated biphenyls (PCBs).

1.3.8 Hazardous Waste

Hazardous Waste is any material that meets the definition of a solid waste and exhibit a hazardous characteristic (ignitability, corrosivity, reactivity, or toxicity) as specified in 40 CFR 261, Subpart C, or contains a listed hazardous waste as identified in 40 CFR 261, Subpart D.

1.3.9 Land Application

Land Application means spreading or spraying discharge water at a rate that allows the water to percolate into the soil. No sheeting action, soil erosion, discharge into storm sewers, discharge into defined drainage areas, or discharge into the "waters of the United States" may occur. Comply with federal, state, and local laws and regulations.

1.3.10 National Pollutant Discharge Elimination System (NPDES)

The NPDES permit program controls water pollution by regulating point sources that discharge pollutants into waters of the United States.

1.3.11 Oily Waste

Oily waste are those materials that are, or were, mixed with Petroleum, Oils, and Lubricants (POLs) and have become separated from that POLs. Oily wastes also means materials, including wastewaters, centrifuge solids, filter residues or sludges, bottom sediments, tank bottoms, and sorbents which have come into contact with and have been contaminated by, POLs and may be appropriately tested and discarded in a manner which is in compliance with other state and local requirements.

This definition includes materials such as oily rags, "kitty litter" sorbent clay and organic sorbent material. These materials may be land filled provided that: It is not prohibited in other state regulations or local ordinances; the amount generated is "de minimus" (a small amount); it is the result of minor leaks or spills resulting from normal process operations; and free-flowing oil has been removed to the practicable extent possible. Large quantities of this material, generated as a result of a major spill or in lieu of proper maintenance of the processing equipment, are a solid waste. As a solid waste, a hazardous waste determination is required prior to disposal. As this can be an expensive process, it is recommended that this type of waste be minimized through good housekeeping practices and employee education.

1.3.12 Pesticide

Pesticide is any substance or mixture of substances intended for preventing, destroying, repelling, or mitigating any pest, or intended for use as a plant regulator, defoliant or desiccant.

1.3.13 Pests

Pests are arthropods, birds, rodents, nematodes, fungi, bacteria, viruses, algae, snails, marine borers, snakes, weeds and other organisms (except for human or animal disease-causing organisms) that adversely affect site activities; attack or damage real property, supplies, equipment, or vegetation; or are otherwise undesirable.

1.3.14 Regulated Waste

Regulated waste are solid wastes that have specific additional federal, state, or local controls for handling, storage, or disposal.

1.3.15 Sediment

Sediment is soil and other debris that have eroded and have been transported by runoff water or wind.

1.3.16 Solid Waste

Solid waste is a solid, liquid, semi-solid or contained gaseous waste. A solid waste can be a hazardous waste, non-hazardous waste, or non-Resource Conservation and Recovery Act (RCRA) regulated waste. Types of solid waste typically generated at construction sites may include:

1.3.16.1 Debris

Debris is non-hazardous solid material generated during the construction, demolition, or renovation of a structure that exceeds 2.5-inch particle size that is: a manufactured object; plant or animal matter; or natural geologic material (for example, cobbles and boulders), broken or removed concrete, masonry, and rock asphalt paving; ceramics; roofing paper and shingles. Inert materials may be reinforced with or contain ferrous wire, rods, accessories and weldments. A mixture of debris and other material such as soil or sludge is also subject to regulation as debris if the mixture is comprised primarily of debris by volume, based on visual inspection.

1.3.16.2 Green Waste

Green waste is the vegetative matter from landscaping, land clearing and grubbing, including, but not limited to, grass, bushes, scrubs, small trees and saplings, tree stumps and plant roots. Marketable trees, grasses and plants that are indicated to remain, be re-located, or be re-used are not included.

1.3.16.3 Non-Hazardous Waste

Non-hazardous waste is waste that is excluded from, or does not meet, hazardous waste criteria in accordance with 40 CFR 263.

1.3.16.4 Recyclables

Recyclable materials identified as part of the work include demolish fence scrap metal, asphalt, and concrete and must be disposed of in accordance with SECTION 02 81 00 - TRANSPORTATION AND DISPOSAL OF WASTE MATERIAL. Document materials recycled in accordance with SECTION 01 33 29 - SUSTAINABILITY REQUIREMENTS AND REPORTING.

1.3.17 Surplus Soil

Surplus soil is existing soil that is in excess of what is required for this work, including aggregates intended, but not used, for on-site mixing of concrete, mortars, and paving. Contaminated soil meeting the definition of hazardous material or hazardous waste is not included and must be managed in accordance with paragraph HAZARDOUS MATERIAL MANAGEMENT.

1.3.18 Surface Discharge

Surface discharge means discharge of water into drainage ditches, storm sewers, creeks or "waters of the United States". Surface discharges are discrete, identifiable sources and require a permit from the governing agency. Comply with federal, state, and local laws and regulations.

1.3.19 Wastewater

Wastewater is the used water and solids from a community that flow to a treatment plant.

1.3.20 Stormwater

Stormwater is any precipitation in an urban or suburban area that does not evaporate or soak into the ground, but instead collects and flows into storm drains, rivers, and streams.

1.3.21 Waters of the United States

Waters of the United States means Federally jurisdictional waters, including wetlands, that are subject to regulation under Section 404 of the Clean Water Act or navigable waters, as defined under the Rivers and Harbors Act.

1.3.22 Wetlands

Wetlands are those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.

1.3.23 Universal Waste

The universal waste regulations streamline collection requirements for certain hazardous wastes in the following categories: batteries, pesticides, mercury-containing equipment (for example, thermostats), and lamps (for example, fluorescent bulbs). The rule is designed to reduce hazardous waste in the municipal solid waste (MSW) stream by making it easier for universal waste handlers to collect these items and send them for recycling or proper disposal. These regulations can be found at 40 CFR 273.

1.4 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. Submit the following to the Contracting Officer in accordance with SECTION 01 33 00 - SUBMITTAL PROCEDURES.

SD-01 Preconstruction Submittals

Preconstruction Survey; FIO

Submit a Preconstruction Survey in accordance with Paragraph 1.6.1.

Regulatory Notifications; G

Submit regulatory notifications in accordance with Paragraph 1.6.2.

Environmental Protection Plan; G

Submit an Environmental Protection Plan in accordance with Paragraph 1.7.

Employee Training Records; G

Submit employee training records in accordance with Paragraph 1.6.5.

Environmental Manager Qualifications; G

Submit environmental manager qualifications in accordance with Paragraph 1.6.4.

Solid Waste Management Permit; G

Submit solid waste management permits in accordance with Paragraph 1.11.

SD-06 Test Reports

Monthly Solid Waste Disposal Report; G

Submit a monthly solid waste disposal report in accordance with Paragraph 1.11.

SD-11 Closeout Submittals

Assembled Employee Training Records; G

Regulatory Notifications; G

Contractor Certification; FIO

1.5 ENVIRONMENTAL PROTECTION REQUIREMENTS

Provide and maintain, during the life of the contract, environmental protection as defined. Plan for and provide environmental protective measures to control pollution that develops during construction practice.

Plan for and provide environmental protective measures required to correct conditions that develop during the construction of permanent or temporary environmental features associated with the project. Protect the environmental resources within the project boundaries and those affected outside the limits of permanent work during the entire duration of this Contract. Comply with federal, state, and local regulations pertaining to the environment, including water, air, solid waste, hazardous waste and substances, oily substances, and noise pollution.

Tests and procedures assessing whether construction operations comply with Applicable Environmental Laws may be required. Analytical work must be performed by qualified laboratories; and where required by law, the laboratories must be certified.

1.6 QUALITY ASSURANCE

1.6.1 Preconstruction Survey and Protection of Features

Prior to start of any onsite construction activities, perform a Preconstruction Survey of the project site with the Contracting Officer, and take photographs and video documentation showing existing environmental conditions in and adjacent to the site. Submit a report for the record. Include in the report a plan describing the features requiring protection under the provisions of the Contract Clauses, which are not specifically identified on the drawings as environmental features requiring protection along with the condition of trees, shrubs and grassed areas immediately adjacent to the site of work and adjacent to the Contractor's assigned storage area and access route(s), as applicable. The Contractor and the Contracting Officer must sign this survey report upon mutual agreement regarding its accuracy and completeness. Protect those environmental features included in the survey report and any indicated on the drawings, regardless of interference that their preservation may cause to the work under the Contract.

1.6.2 Regulatory Notifications

Provide regulatory notification requirements in accordance with federal, state and local regulations. In cases where the Government will also provide public notification, coordinate with the Contracting Officer. Submit copies of regulatory notifications to the Contracting Officer at least 14 days prior to commencement of work activities. Typically, regulatory notifications must be provided for the following (this listing is not all-inclusive): NPDES defined site work, construction, removal or use of a permitted air emissions source, and remediation of controlled substances (asbestos, hazardous waste, lead paint).

1.6.3 Environmental Brief

Attend an environmental brief to be included in the pre-construction meeting. Provide the following information: types, quantities, and use of hazardous materials that will be handled onsite; and types and quantities of wastes/wastewater that may be generated during the Contract. Discuss the results of the Preconstruction Survey at this time.

Prior to initiating any work on site, meet with the Contracting Officer to discuss the proposed Environmental Protection Plan (EPP). Develop a mutual understanding relative to the details of environmental protection, including measures for protecting natural and cultural resources, required reports, required permits, permit requirements (such as mitigation

measures), and other measures to be taken.

1.6.4 Environmental Manager

Appoint in writing an Environmental Manager for the project site. The Environmental Manager is directly responsible for coordinating contractor compliance with federal, state, local, and installation requirements. The Environmental Manager must ensure compliance with Hazardous Waste Program requirements (including hazardous waste handling, storage, manifesting, and disposal); implement the EPP; ensure environmental permits are obtained, maintained, and closed out; ensure compliance with Stormwater Program requirements; ensure compliance with Hazardous Materials (storage, handling, and reporting) requirements; and coordinate any remediation of regulated substances. This can be a collateral position; however, the person in this position must be trained to adequately accomplish the following duties: ensure waste segregation and storage compatibility requirements are met; inspect and manage Satellite Accumulation areas; ensure only authorized personnel add wastes to containers; ensure Contractor personnel are trained in 40 CFR requirements in accordance with their position requirements; coordinate removal of waste containers; and maintain the Environmental Records binder and required documentation, including environmental permits compliance and close-out. Submit Environmental Manager Qualifications to the Contracting Officer.

1.6.5 Employee Training Records

Prepare and maintain Employee Training Records throughout the term of the contract meeting applicable 40 CFR requirements. Provide Employee Training Records in the Environmental Records Binder. Submit these Assembled Employee Training Records to the Contracting Officer at the conclusion of the project, unless otherwise directed.

Train personnel to meet EPA and state requirements. Conduct environmental protection/pollution control meetings for personnel prior to commencing construction activities. Conduct additional meetings for new personnel and when site conditions change. Include in the training and meeting agenda: methods of detecting and avoiding pollution; familiarization with statutory and contractual pollution standards; installation and care of devices, vegetative covers, and instruments required for monitoring purposes to ensure adequate and continuous environmental protection/pollution control; anticipated hazardous or toxic chemicals or wastes, and other regulated contaminants; recognition and protection of wetlands, archaeological sites, artifacts, waters of the United States, and endangered species and their habitat that are known to be in the area.

1.6.6 Non-Compliance Notifications

The Contracting Officer will notify the Contractor in writing of any observed noncompliance with federal, state or local environmental laws or regulations, permits, and other elements of the Contractor's EPP. After receipt of such notice, inform the Contracting Officer of the proposed corrective action and take such action when approved by the Contracting Officer. The Contracting Officer may issue an order stopping all or part of the work until satisfactory corrective action has been taken. This is in addition to any other actions the Contracting Officer may take under the contract, or in accordance with the Federal Acquisition Regulation or Federal Law.

1.7 ENVIRONMENTAL PROTECTION PLAN

The purpose of the Environmental Protection Plan (EPP) is to present an overview of known or potential environmental issues that the Contractor must consider and address during construction. Include in the EPP measures for protecting natural and cultural resources, required reports, and other measures to be taken. Meet with the Contracting Officer or Contracting Officer Representative to discuss the EPP and develop a mutual understanding relative to the details for environmental protection including measures for protecting natural resources, required reports, and other measures to be taken.

Submit the EPP within 14 days prior to the Pre-Work Conference. Revise the EPP throughout the project to include any reporting requirements, changes in site conditions, or contract modifications that change the project scope of work in a way that could have an environmental impact. No requirement in this section will relieve the Contractor of any applicable federal, state, and local environmental protection laws and regulations. During Construction, identify, implement, and submit for approval any additional requirements to be included in the EPP. Maintain the current version onsite.

The EPP includes, but is not limited to, the following elements. Topics or issues which are not identified in this section, but which the Contractor considers necessary, must be identified and discussed after those items formally identified in this section.

1.7.1 General Overview and Purpose

1.7.1.1 Descriptions

A brief description of each specific plan required by environmental permits or elsewhere in this Contract including, but not limited to, the following.

- a. Temporary Site Facility Plan
- b. Site Preparation Plan
- c. Waste Management and Transportation Plan

1.7.1.2 Duties

The duties and level of authority assigned to the person(s) on the job site who oversee environmental compliance, such as who is responsible for adherence to the EPP, who is responsible for spill cleanup and training personnel on spill response procedures, who is responsible for manifesting hazardous waste to be removed from the site (if applicable), and who is responsible for training the Contractor's environmental protection personnel.

1.7.1.3 Procedures

A copy of any standard or project-specific operating procedures that will be used to effectively manage and protect the environment on the project site.

1.7.1.4 Communications

Communication and training procedures that will be used to convey environmental management requirements to Contractor employees and subcontractors.

1.7.1.5 Contact Information

Emergency contact information (office phone number, cell phone number, and e-mail address).

1.7.2 General Site Information

1.7.2.1 Drawings

Drawings showing locations of proposed material storage areas, jurisdictional wetlands, structures, sanitary facilities, storm drains and conveyances.

1.7.2.2 Work Area

Work area plan showing the proposed activity in each portion of the area and identify the areas of limited use or nonuse. Include measures for marking the limits of use areas, including methods for protection of features to be preserved within authorized work areas and methods to control runoff and to contain materials on site.

1.7.2.3 Documentation

A letter signed by an officer of the firm appointing the Environmental Manager and stating that person is responsible for managing and implementing the Environmental Program as described in this contract. Include in this letter the Environmental Manager's authority to direct the removal and replacement of non-conforming work.

1.7.3 Plans

1.7.3.1 Non-hazardous Solid Waste Disposal Plan

Include as an appendix to the EPP, a non-hazardous solid waste disposal plan identifying methods and locations for solid waste disposal. The plan must include schedules for disposal. The Contractor must identify any subcontractors responsible for the transportation and disposal of solid waste. Licenses or permits must be submitted for solid waste disposal sites that are not commercial operating facilities. Evidence of each the disposal facility's acceptance of the solid waste must be attached to this plan during the construction. The Contractor must attach a copy of each of the Non-Hazardous Solid Waste Diversion Reports to the disposal plan. The report must be submitted on the first working day after the first quarter that non-hazardous solid waste has been disposed of and/or diverted and shall be for the previous quarter (e.g. the first working day of January, April, July and October). The report must indicate the total amount of waste generated and total amount of waste diverted in tons along with the percent that was diverted.

1.7.3.2 Contaminant Prevention Plan

Include as an appendix to the EPP, a contaminant prevention plan that identifies potentially hazardous substances to be used on the job site;

identifies the intended actions to prevent introduction of such materials into the air, water, or ground; and details provisions for compliance with Federal, State, and local laws and regulations for storage and handling of these materials. In accordance with EM 385-1-1, a copy of the Safety Data Sheets (SDS) and the maximum quantity of each hazardous material to be on site at any given time must be included in the contaminant prevention plan. As new hazardous materials are brought on site or removed from the site, update the plan.

1.7.3.3 Waste Water Management Plan

Include as an appendix to the EPP, a waste water management plan that identifies the methods and procedures for management of waste waters which are directly derived from construction activities, such as well development water, purging water during sampling, decontamination water. If disposal is to a sanitary sewer, the plan must include documentation that the Waste Water Treatment Plant Operator has approved the volume and type of discharge.

1.7.4 Management of Natural Resources

- a. Tree protection in accordance with Section 802
- b. Replacement of damaged landscape features

1.7.5 Stormwater Management and Control

- a. Ground cover
- b. Erodible soils
- c. Temporary measures
 - (1) Structural Practices
 - (2) Temporary and permanent stabilization
- d. Effective selection, implementation and maintenance of Best Management Practices (BMPs).
- e. Stormwater Pollution Prevention Plan (SWPPP).

1.7.6 Protection of the Environment from Waste Derived from Contractor Operations

- a. Used oil management procedures in accordance with 40 CFR 279; Hazardous waste minimization procedures
- b. Plans for the handling and disposal of hazardous waste is covered as part of the Waste Management and Disposal Plan developed in accordance with SECTION 02 81 00 - TRANSPORTATION AND DISPOSAL OF WASTE MATERIAL.
- c. Control and disposal of solid and sanitary waste.
- d. Management procedures for recyclable hazardous materials such as lead-acid batteries, used oil, and similar

1.7.7 Prevention of Releases to the Environment

- a. Procedures to prevent releases to the environment
- b. Notifications in the event of a release to the environment

1.7.8 Regulatory Notification and Permits

List what notifications and permit applications will be made. Some permits require up to 180 days to obtain. Demonstrate that those permits have been obtained or applied for by including copies of applicable environmental permits. The EPP will not be approved until the permits have been obtained.

Attach copies of all environmental permits, permit application packages, approvals to construct, notifications, certifications, reports, and termination documents to the Environmental Protection Plan as an appendix.

1.7.9 Clean Air Act Compliance

1.7.9.1 Haul Route

Submit truck and material haul routes along with the Waste Management and Disposal Plan developed in accordance with SECTION 02 81 00 - TRANSPORTATION AND DISPOSAL OF WASTE MATERIAL for controlling dirt, debris, and dust on site haul routes. As a minimum, identify in the plan the subcontractor and equipment for cleaning along the haul route and measures to reduce dirt, dust, and debris from haul routes.

1.7.9.2 Pollution Generating Equipment

Identify air pollution generating equipment or processes that may require federal, state, or local permits under the Clean Air Act. Provide a list of all fixed or mobile equipment, machinery or operations that could generate air emissions during the project to the Contracting Officer.

1.7.9.3 Stationary Internal Combustion Engines

Identify portable and stationary internal combustion engines that will be supplied, used or serviced. Comply with 40 CFR 60 Subpart IIII, 40 CFR 60 Subpart JJJJ, 40 CFR 63 Subpart ZZZZ, and local regulations as applicable. At minimum, include the make, model, serial number, manufacture date, size (engine brake horsepower), and EPA emission certification status of each engine. Maintain applicable records and log hours of operation and fuel use. Logs must include reasons for operation and delineate between emergency and non-emergency operation.

1.7.9.4 Air Pollution-engineering Processes

Identify planned air pollution-generating processes and management control measures (including, but not limited to, spray painting, material handling, fugitive dust, and fugitive emissions).

1.7.9.5 Monitoring

For the protection of public health, monitor and control contaminant emissions to the air from Hazardous, Toxic, and Radioactive Waste remedial action area sources to minimize short-term risks that might be posed to the site workers during implementation of the remedial alternative in

accordance with the SECTION 01 35 29 - HEALTH, SAFETY, AND EMERGENCY RESPONSE PROCEDURES.

1.7.9.6 Compliant Materials

Provide the Government a list of and SDSs for all hazardous materials proposed for use on site. Materials must be compliant with all Clean Air Act regulations for emissions including solvent and volatile organic compound contents, and applicable National Emission Standards for Hazardous Air Pollutants requirements. As new hazardous materials are brought on site or removed from the site, update the plan. The Government may alter, or limit use of specific materials as needed to meet permit requirements for emissions.

1.8 LICENSES AND PERMITS

Obtain licenses and permits required for the construction of the project and in accordance with FAR 52.236-7 Permits and Responsibilities. Notify the Government of all general use permitted equipment the Contractor plans to use on site. This paragraph supplements the Contractor's responsibility under FAR 52.236-7 Permits and Responsibilities. A list of permits is detailed in SECTION 01 11 00 - SUMMARY OF WORK.

1.9 ENVIRONMENTAL RECORDS BINDER

Maintain on-site a separate three-ring Environmental Records Binder and submit at the completion of the project. Make separate parts within the binder that correspond to each submittal listed under paragraph CLOSEOUT SUBMITTALS in this section and the waste determination documentation, disposal documentation for hazardous and regulated waste, and solid waste management permits and reports.

1.10 PESTICIDE DELIVERY, STORAGE, AND HANDLING

1.10.1 Delivery and Storage

Deliver pesticides to the site in the original, unopened containers bearing legible labels indicating the EPA registration number and the manufacturer's registered uses. Store pesticides according to manufacturer's instructions and under lock and key when unattended.

1.10.2 Handling Requirements

Formulate, treat with, and dispose of pesticides and associated containers in accordance with label directions and use the clothing and personal protective equipment specified on the labeling for use during each phases of the application. Furnish SDSs for pesticide products.

1.11 SOLID WASTE MANAGEMENT

Provide the Contracting Officer with written notification of the quantity of anticipated solid waste or debris that is anticipated or estimated to be generated by construction. Include in the report the locations where various types of waste will be disposed or recycled. Include letters of acceptance from the receiving location or as applicable; submit one copy of the receiving location state and local Solid Waste Management Permit or license showing such agency's approval of the disposal plan before transporting wastes off Government property.

Monthly, submit a solid waste disposal report to the Contracting Officer. For each waste, the report must state the classification (using the definitions provided in this section), amount, location, and name of the business receiving the solid waste.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.1 PROTECTION OF NATURAL RESOURCES

Minimize interference with, disturbance to, and damage to fish, wildlife, and plants, including their habitats. Prior to the commencement of activities, consult federal and state agencies regarding rare species or sensitive habitats that need to be protected. The protection of rare, threatened, and endangered animal and plant species identified, including their habitats, is the Contractor's responsibility.

Preserve the natural resources within the project boundaries and outside the limits of permanent work. Restore to an equivalent or improved condition upon completion of work that is consistent with the requirements of federal and state agencies. Confine construction activities to within the limits of the work indicated or specified.

3.1.1 Flow Ways

Do not alter water flows or otherwise significantly disturb the native habitat adjacent to the project and critical to the survival of fish and wildlife, except as specified and permitted.

3.1.2 Vegetation

Except in areas to be cleared, do not remove, cut, deface, injure, or destroy trees or shrubs without the Contracting Officer's permission. Do not fasten or attach ropes, cables, or guys to existing nearby trees for anchorages unless authorized by the Contracting Officer. Where such use of attached ropes, cables, or guys is authorized, the Contractor is responsible for any resultant damage.

Protect existing trees that are to remain to ensure they are not injured, bruised, defaced, or otherwise damaged by construction operations. Remove displaced rocks from uncleared areas. Coordinate with the Contracting Officer and state agencies to determine appropriate action for trees and other landscape features scarred or damaged by equipment operations.

3.2 STORMWATER

Perform stormwater management in accordance with federal, state, and local regulations. Do not discharge stormwater from construction sites to the sanitary sewer.

3.2.1 Work Area Limits

Mark the areas that need not be disturbed under this Contract prior to commencing construction activities. Mark or fence isolated areas within the general work area that are not to be disturbed. Protect monuments and markers before construction operations commence. Where construction operations are to be conducted during darkness, any markers must be visible in the dark. Personnel must be knowledgeable of the purpose for

marking and protecting particular objects.

3.2.2 Contractor Facilities and Work Areas

Place field offices, staging areas, and temporary buildings in areas designated on the drawings or as directed by the Contracting Officer. Move or relocate the Contractor facilities only when approved by the Government.

3.3 SURFACE AND GROUNDWATER

Do not enter, disturb, destroy, or allow discharge of contaminants into waters of the United States, except as authorized herein. The protection of waters of the United States in accordance with paragraph 1.8 LICENSES AND PERMITS is the Contractor's responsibility.

The Contractor must monitor construction activities to prevent pollution of surface and groundwater. Toxic or hazardous chemicals must not be applied to soil or vegetation unless otherwise indicated.

3.4 PROTECTION OF CULTURAL RESOURCES

If, during excavation or other construction activities, any previously unidentified or unanticipated historical, archaeological, and cultural resources are discovered or found, activities that may damage or alter such resources must be suspended. Resources covered by this paragraph include but are not limited to: any human skeletal remains or burials; artifacts; shell, midden, bone, charcoal, or other deposits; rock or coral alignments, pavings, wall, or other constructed features; and any indication of agricultural or other human activities. Upon such discovery or find, immediately notify the Contracting Officer so that the appropriate authorities may be notified, and a determination made as to their significance and what, if any, special disposition of the finds should be made. Cease all activities that may result in impact to or the destruction of these resources. Secure the area and prevent employees or other persons from trespassing on, removing, or otherwise disturbing such resources. The Government retains ownership and control over archaeological resources.

3.5 AIR RESOURCES

Equipment operation, activities, or processes must be in accordance with 40 CFR 64 and state air emission and performance laws and standards.

3.5.1 Burning

Burning is prohibited on the site.

3.5.2 Class I and II ODS Prohibition

The use of class I and II ODS is prohibited at the site.

3.5.3 Dust Control

3.5.3.1 Dust Control

Keep dust down at all times, including during nonworking periods. Sprinkle or treat, with dust suppressants, the soil at the site, haul roads, and other areas disturbed by operations. Dry power brooming will not be

permitted. Instead, use vacuuming, wet mopping, wet sweeping, or wet power brooming. Air blowing will be permitted only for cleaning nonparticulate debris such as steel reinforcing bars. Only wet cutting will be permitted for cutting concrete blocks, concrete, and bituminous concrete.

3.5.3.2 Particulates

Control dust particles, aerosols and gaseous by-products from construction activities, and processing and preparation of materials at all times, including weekends, holidays, and hours when work is not in progress. Maintain excavations, stockpiles, haul roads, permanent and temporary access roads, plant sites, spoil areas, borrow areas, and other work areas within or outside the project boundaries free from particulates that would exceed 40 CFR 50, state, and local air pollution standards or that would cause a hazard or a nuisance. Sprinkling, chemical treatment of an approved type, baghouse, scrubbers, electrostatic precipitators, or other methods will be permitted to control particulates in the work area. Sprinkling, to be efficient, must be repeated to keep the disturbed area damp. Provide sufficient, competent equipment available to accomplish these tasks. Perform particulate control as the work proceeds and whenever a particulate nuisance or hazard occurs. Comply with state and local visibility regulations.

3.5.4 Odors

Control odors from construction activities. The odors must be in compliance with state regulations and local ordinances and may not constitute a health hazard.

3.6 WASTE MINIMIZATION

Minimize the use of hazardous materials and the generation of waste. Include procedures for pollution prevention/ hazardous waste minimization in the Hazardous Waste Management Section of the EPP.

3.6.1 Salvage, Reuse and Recycle

Identify anticipated materials and waste for salvage, reuse, and recycling. Describe actions to promote material reuse, resale or recycling. To the extent practicable, send all scrap metal for reuse or recycling not to be disposed of in a landfill.

Include the name, physical address, and telephone number of the hauler, if transported by a franchised solid waste hauler. Include the destination and, unless exempted, provide a copy of the state or local permit (cover) or license for recycling.

3.7 WASTE MANAGEMENT AND DISPOSAL

3.7.1 Waste Determination Documentation

Waste handling and disposal is specified in SECTION 02 81 00 - TRANSPORTATION AND DISPOSAL OF WASTE MATERIAL.

3.7.2 Control and Management of Solid Wastes

Pick up solid wastes, and place in covered containers that are regularly emptied. Do not prepare or cook food on the project site. Prevent

contamination of the site or other areas when handling and disposing of wastes. At project completion, leave the areas clean. Employ segregation measures so that no hazardous or toxic waste become co-mingled with non-hazardous solid waste. Solid waste disposal offsite must comply with most stringent local, state, and federal requirements, including 40 CFR 241, 40 CFR 243, and 40 CFR 258.

Manage hazardous material used in construction, including but not limited to, aerosol cans, waste paint, cleaning solvents, contaminated brushes, and used rags, in accordance with 49 CFR 173.

3.7.3 Control and Management of Hazardous Waste

Do not dispose of hazardous waste on the site, except as noted within the Contract Documents. Do not discharge any waste to a sanitary sewer, storm drain, or to surface waters or conduct waste treatment or disposal on Government property without written approval of the Contracting Officer.

3.7.3.1 Hazardous Waste Disposal

Perform hazardous waste disposal in accordance with SECTION 02 81 00 - TRANSPORTATION AND DISPOSAL OF WASTE MATERIAL.

3.7.3.2 Universal Waste Management

Manage the following categories of universal waste in accordance with federal, state, and local requirements.

- a. Batteries as described in 40 CFR 273.2
- b. Lamps as described in 40 CFR 273.5
- c. Mercury-containing equipment as described in 40 CFR 273.4
- d. Pesticides as described in 40 CFR 273.3

Dumping of mercury-containing and PCB-containing materials and devices such as mercury vapor lamps, fluorescent lamps, and mercury switches, in rubbish containers is prohibited.

3.7.3.3 Electronics End-of-Life Management

Recycle or dispose of electronics waste, including, but not limited to, used electronic devices such computers, monitors, hard-copy devices, televisions, mobile devices, in accordance with 40 CFR 260, 40 CFR 261, 40 CFR 262, state, and local requirements, and installation instructions.

3.7.4 Releases/Spills of Oil and Hazardous Substances

3.7.4.1 Response and Notifications

Exercise due diligence to prevent, contain, and respond to spills of hazardous material, hazardous substances (as designated in 40 CFR 302), hazardous waste, sewage, regulated gas, petroleum, lubrication oil, and other substances regulated in accordance with 40 CFR 300. Maintain spill cleanup equipment and materials at the work site. In the event of a spill, take prompt, effective action to stop, contain, curtail, or otherwise limit the amount, duration, and severity of the spill/release. In the event of any releases of oil and hazardous substances, chemicals,

or gases; immediately (within 15 minutes) notify the Contracting Officer and the state or local authority.

Submit all verbal and written notifications required in accordance with federal (40 CFR 300.125 and 40 CFR 355), state, local regulations and instructions. Provide copies of the written notification and documentation that a verbal notification was made within 20 days. Perform spill response in accordance with 40 CFR 300 and applicable state and local regulations. Contain and clean up these spills.

3.7.4.2 Clean Up

Clean up hazardous and non-hazardous waste spills.

3.7.5 Mercury Materials

Immediately report to the Contracting Officer instances of breakage or mercury spillage. Clean mercury spill area to the satisfaction of the Contracting Officer.

Do not recycle a mercury spill cleanup; manage it as a hazardous waste as directed by the Contracting Officer

3.7.6 Wastewater

The disposal of wastewater generated as part of excavation activities and decontamination efforts at the site is specified in SECTION 02 81 00 - TRANSPORTATION AND DISPOSAL OF WASTE MATERIAL.

3.8 HAZARDOUS MATERIAL MANAGEMENT

Include hazardous material control procedures in the Safety Plan, in accordance with SECTION 01 35 29 - HEALTH, SAFETY, AND EMERGENCY RESPONSE PROCEDURES. Address procedures and proper handling of hazardous materials, including the appropriate transportation requirements. Do not bring hazardous material onto Government property that does not directly relate to requirements for the performance of this contract. Submit an SDS and estimated quantities to be used for each hazardous material to the Contracting Officer prior to bringing the material on the site. Typical materials requiring SDS and quantity reporting include, but are not limited to, oil and latex based painting and caulking products, solvents, adhesives, aerosol, and petroleum products. Use hazardous materials in a manner that minimizes the amount of hazardous waste generated. Containers of hazardous materials must have National Fire Protection Association labels or their equivalent. Certify that hazardous materials removed from the site are hazardous materials and do not meet the definition of hazardous waste, in accordance with 40 CFR 261.

3.9 PREVIOUSLY USED EQUIPMENT

Clean previously used construction equipment prior to bringing it onto the project site. Equipment must be free from soil residuals, egg deposits from plant pests, noxious weeds, and plant seeds. Consult with the U.S. Department of Agriculture jurisdictional office for additional cleaning requirements.

3.10 PETROLEUM, OIL, LUBRICANT (POL) STORAGE AND FUELING

POL products include flammable or combustible liquids, such as gasoline,

diesel, lubricating oil, used engine oil, hydraulic oil, mineral oil, and cooking oil. Store POL products and fuel equipment and motor vehicles in a manner that affords the maximum protection against spills into the environment. Manage and store POL products in accordance with EPA 40 CFR 112, and other federal, state, regional, and local laws and regulations. Use secondary containments, dikes, curbs, and other barriers, to prevent POL products from spilling and entering the ground, storm or sewer drains, stormwater ditches or canals, or navigable waters of the United States. Describe in the EPP how POL tanks and containers must be stored, managed, and inspected and what protections need to be provided. Storage of fuel on the project site must be in accordance with EPA, state, and local laws and regulations and paragraph 3.10.2.

3.10.1 Used Oil Management

Manage used oil generated on site in accordance with 40 CFR 279. Determine if any used oil generated while onsite exhibits a characteristic of hazardous waste. Used oil containing 1,000 parts per million of solvents is considered a hazardous waste and disposed of. Used oil mixed with a hazardous waste is also considered a hazardous waste. Dispose in accordance with paragraph HAZARDOUS WASTE DISPOSAL.

3.10.2 Oil Storage Including Fuel Tanks

Provide secondary containment and overfill protection for oil storage tanks. A berm used to provide secondary containment must be of sufficient size and strength to contain the contents of the tanks plus 5 inches freeboard for precipitation. Construct the berm to be impervious to oil for 72 hours so that no discharge permeates, drains, infiltrates, or otherwise escapes before cleanup occurs. Use drip pans during oil transfer operations; adequate absorbent material must be onsite to clean up any spills and prevent releases to the environment. Cover tanks and drip pans during inclement weather. Provide procedures and equipment to prevent overfilling of tanks. If tanks and containers with an aggregate aboveground capacity greater than 1320 gallons will be used onsite (only containers with a capacity of 55 gallons or greater are counted), provide and implement a spill prevention, control, and countermeasure (SPCC) plan meeting the requirements of 40 CFR 112. Do not bring underground storage tanks to the site for Contractor use during a project. Submit the SPCC plan to the Contracting Officer for approval.

Monitor and remove any rainwater that accumulates in open containment dikes or berms. Inspect the accumulated rainwater prior to draining from a containment dike to the environment, to determine there is no oil sheen present.

3.11 INADVERTENT DISCOVERY OF PETROLEUM-CONTAMINATED SOIL OR HAZARDOUS WASTES

If petroleum-contaminated soil, or suspected hazardous waste is found during construction that was not identified in the Contract documents, immediately notify the Contracting Officer. Do not disturb this material until authorized by the Contracting Officer.

3.12 PEST MANAGEMENT

In order to minimize impacts to existing fauna and flora, coordinate with the Contracting Officer at the earliest time possible prior to pesticide application. The use and management of pesticides are regulated under

40 CFR 152 - 186.

3.13 SOUND INTRUSION

Make the maximum use of low-noise emission products, as certified by the EPA. Blasting or use of explosives are prohibited at the site.

Keep construction activities under surveillance and control to minimize environment damage by noise. Comply with the provisions of the State and local rules.

3.14 POST CONSTRUCTION CLEANUP

Clean up areas used for construction in accordance with Contract Clause: "Cleaning Up". Unless otherwise instructed in writing by the Contracting Officer, remove traces of temporary construction facilities such as haul roads, work area, structures, foundations of temporary structures, stockpiles of excess or waste materials, and other vestiges of construction prior to final acceptance of the work. Grade parking area and similar temporarily used areas to conform with surrounding contours.

-- End of Section --

SECTION 01 58 00

PROJECT IDENTIFICATION

PART 1 GENERAL

1.1 SCOPE OF WORK

Furnish all labor, equipment, materials and incidentals required to provide and erect a U.S. Environmental Protection Agency (EPA)/U.S. Army Corps of Engineers (USACE) project site sign, safety signs, and a bulletin board.

Provide and erect an EPA/USACE project site sign and safety signs meeting the requirements of this Section at a location to be determined by the Contracting Officer. The sign requirements are shown at the end of this section. Wording to be included on each sign will be provided by the Government after contract award.

1.2 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only. Where reference is made to one of these standards, the revision in effect at the time of contract award applies.

CODE OF FEDERAL REGULATIONS (CFR)

29 CFR 1903	Inspections, Citations, and Proposed Penalties
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U.S. ARMY CORPS OF ENGINEERS (USACE)

EP 310-1-6a	Sign Standards Manual, VOL 1
EP 310-1-6b	Sign Standards Manual, VOL 2, Appendices

PART 2 PRODUCTS

2.1 MATERIALS

Materials must conform to the requirements as shown on the attachment at the end of this section and must be suitable for use in an unprotected exterior environment.

Dollar amounts and wording changes will be provided by the Contracting Officer after award.

PART 3 EXECUTION

3.1 GENERAL

Prior to initiating any work on site, furnish the construction project sign package at the location designated by the Contracting Officer. Maintain the signs throughout the life of the project. The construction project sign package consists of two signs: one for project identification and the other to show the on-the-job safety performance of the Contractor.

3.2 PROJECT IDENTIFICATION SIGN

Provide a project identification sign and place the sign in accordance with EP 310-1-6a, EP 310-1-6b, and the requirements as shown on the attachment at the end of this section.

3.3 SAFETY SIGN

Place signs on the work area fence that bear the legend, in letters at least four inches high:

WARNING
HAZARDOUS WORK AREA
DO NOT ENTER UNLESS AUTHORIZED

Post hazard warning banners at areas of special hazard including, but not limited to, the perimeter of the Exclusion Zone. Provide all signs required in the Contract Documents. Letters must be at least four inches high. Post appropriate hazard warning banners for working near active overhead power lines.

3.4 INSTALLATION REQUIREMENTS

The EPA/USACE project site sign and the safety signs are to be mounted on 4-inch by 4-inch by 8-foot treated timbers and set firmly into the ground above prevailing grade to permit public viewing. Install signs during site mobilization in accordance with the requirements of EP 310-1-6a included at the end of this section.

3.5 BULLETIN BOARD

Immediately upon starting work, provide a weatherproof glass-covered bulletin board not less than 36 inches by 48 inches in size for displaying the Equal Employment Opportunity poster, a copy of the wage decision contained in the Contract, the Wage Rate Information poster and other information approved by the Contracting Officer. Locate the bulletin board at the project site in a conspicuous place easily accessible to all employees, as approved by the Contracting Officer. Display legible copies of the aforementioned information until work is completed. Upon completion of work, remove the bulletin board, which will remain the property of the Contractor.

Post and maintain a notice or notices, to be furnished by the Occupational Safety and Health Administration (OSHA), U.S. Department of Labor, informing employees of the protections and obligations provided for in the Occupational Safety and Health Act as per OSHA 29 Code of Federal Regulations 1903.2(a)(1)(29 CFR 1903). Post such notice or notices in a conspicuous place or places where notices to employees are customarily posted. Take steps to ensure that such notices are not altered, defaced, or covered by other material.

3.6 CLOSURE REQUIREMENTS

The EPA/USACE project site sign, bulletin board and the safety signs are to be removed from the Site after contract completion or as approved by the Contracting Officer.

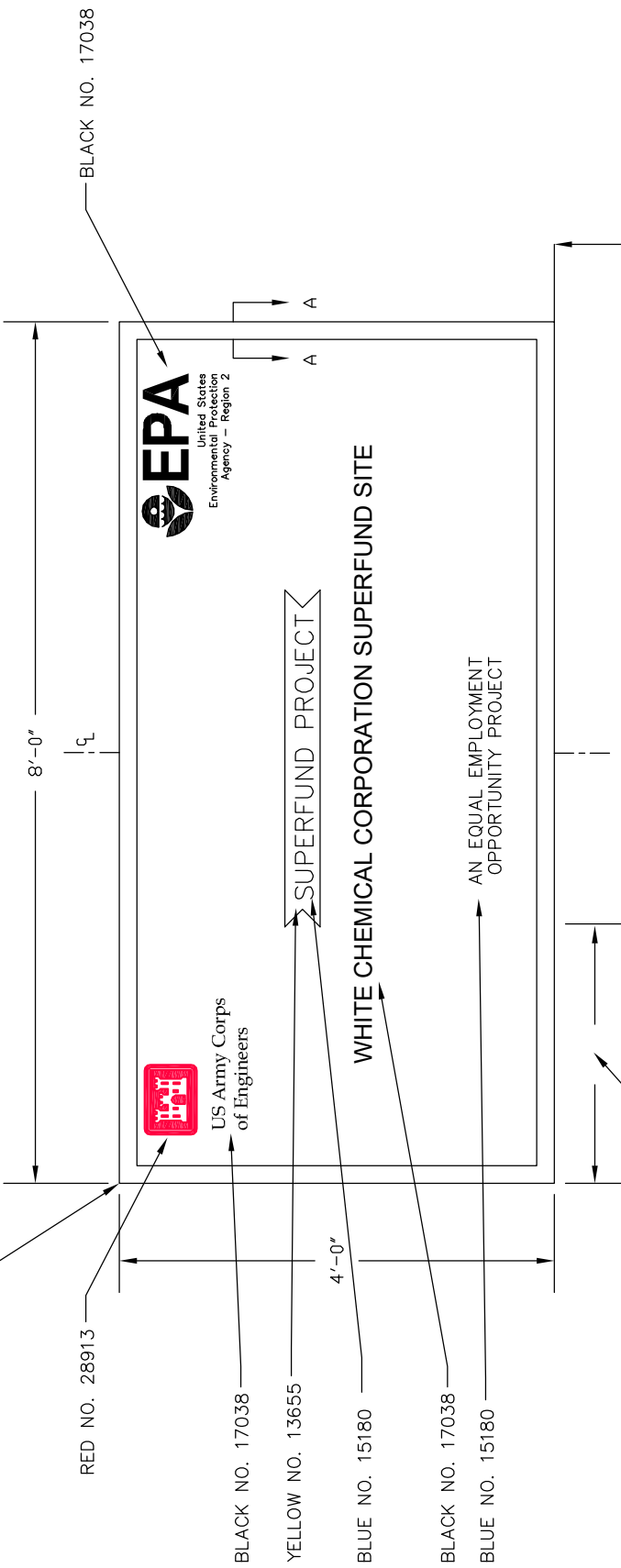
White Chemical Corporation Superfund Site, OU3
Final 100% Remedial Design

PART 4 ATTACHMENTS

1. Project Sign Information
2. Safety Performance Sign Detail
3. Fabrication and Mounting Guidelines

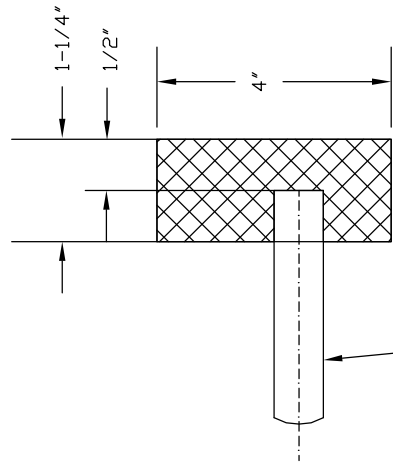
-- End of Section --

MITER EDGE AT ALL CORNERS



LEFT BORDER SHALL BE DETERMINED USING THE LONGEST LINE CENTERED ON THE SIGN PROVIDING EQUAL BORDERS

PROVIDE ADEQUATE SUPPORTS FOR SIGN AS SITE CONDITIONS MAY REQUIRE AND KEEP SIGN A PROPER DISTANCE ABOVE PREVAILING GRADE TO PERMIT PUBLIC VIEWING.



GRADE



COLOR NUMBERS REFER TO FEDERAL COLOR STANDARDS NO. 595a (1-68), WHICH ARE AVAILABLE FROM GSA SUPPLIES.

BACKGROUND AND ALL OTHER SIGN COMPONENTS NOT DESIGNATED ARE PAINTED WHITE NO. 17886.

SECTION "A-A"

Each contractor's safety record is to be posted on Corps managed or supervised construction projects and mounted with the Construction Project Identification sign specified on page 16-2.

The graphic format, color, size and typefaces used on the sign are to be reproduced exactly as specified below. The

title with First Aid logo in the top section of the sign, and the performance record captions are standard for all signs of this type. Legend groups 2 and 3 below identify the project and the contractor and are to be placed on the sign as shown.

Safety record numbers are mounted on individual metal plates and are screw-

mounted to the background to allow for daily revisions to posted safety performance record.

Special applications or situations not covered in these guidelines should be referred to the district Sign Program Manager.

Legend Group 1: Standard two-line title "Safety is a Job Requirement" with 8" (outside diameter) Safety Green first aid logo.
Color: To match Pantone system 347
Typeface: 3" Helvetica Bold
Color: Black

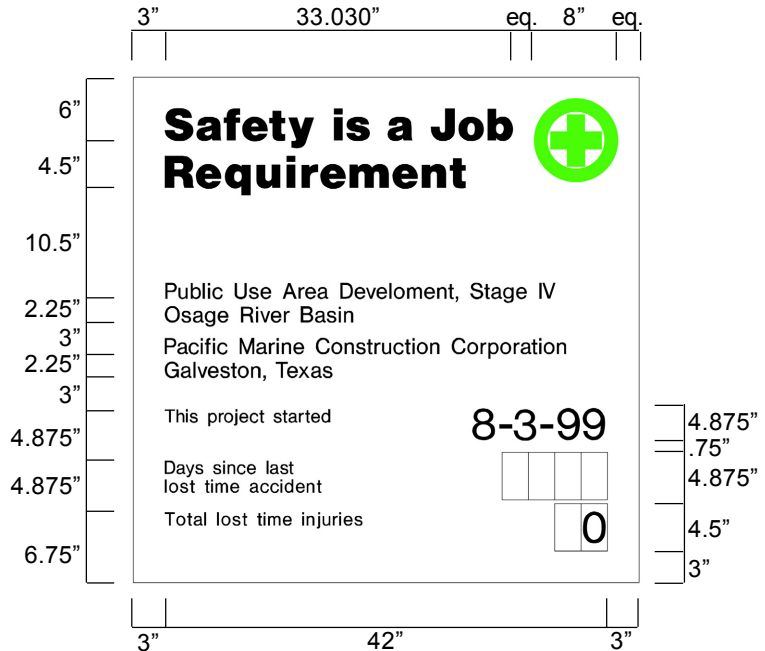
Legend Group 2: One- to two-line project title legend describes the work being done under this contract and name of host project.
Color: Black
Typeface: 1.5" Helvetica Regular
Maximum line length: 42"

Legend Group 3: One- to two-line identification: name of prime contractor and city, state address. Color: Black
Typeface: 1.5" Helvetica Regular
Maximum line length: 42"

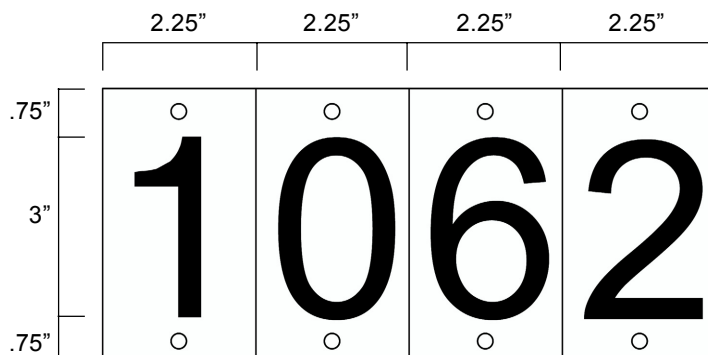
Legend Group 4: Standard safety record captions as shown.
Color: Black
Typeface: 1.25" Helvetica Regular

Replaceable numbers are to be mounted on white .060 aluminum plates and screw-mounted to background.
Color: Black
Typeface: 3" Helvetica Regular
Plate size: 2.5" x 4.5"

All typography is flush left and rag right, upper and lower case with initial capitals only as shown. Letter- and word-spacing to follow Corps standards as specified in Appendix D.



Sign Type	Legend Size (A)	Panel Size	Post Size	Specification Code	Mounting Height	Color Bkg/Lgd
CID-02	various	4"x4'	4"x4"	HDO-3	48"	WH/BK-SG



All Construction Project Identification signs and Safety Performance signs are to be fabricated and installed as described below. The signs are to be erected at a location designated by the contracting officer representative and shall conform to the size, format, and typographic standards shown on pages 16-2 and 16-3. Detailed specifications for HDO plywood panel preparation are provided in Appendix B.

The sign panels are to be fabricated from .75" High Density Overlay Plywood. Panel preparation to follow HDO specifications provided in Appendix B.

Sign graphics to be prepared on a white nonreflective vinyl film with positionable adhesive backing.

All graphics except for the Communication Red background with Corps Signature on the project sign are to be die-cut or computer-cut nonreflective vinyl, prespaced legends prepared in the sizes and typefaces specified and applied to the background panel following the graphic formats shown on pages 16-2 and 16-3.

The 2'x 4' Communication Red panel (to match Pantone system 032) with full Corps Signature (reverse version) is to be screen-printed on the white background. Identification of the district or division may be applied under the signature with white cut vinyl letters prepared to Corps standards.

Drill and insert six (6) .375" T-nuts from the front face of the HDO sign panel. Position holes as shown. Flange of T-nut to be flush with sign face.

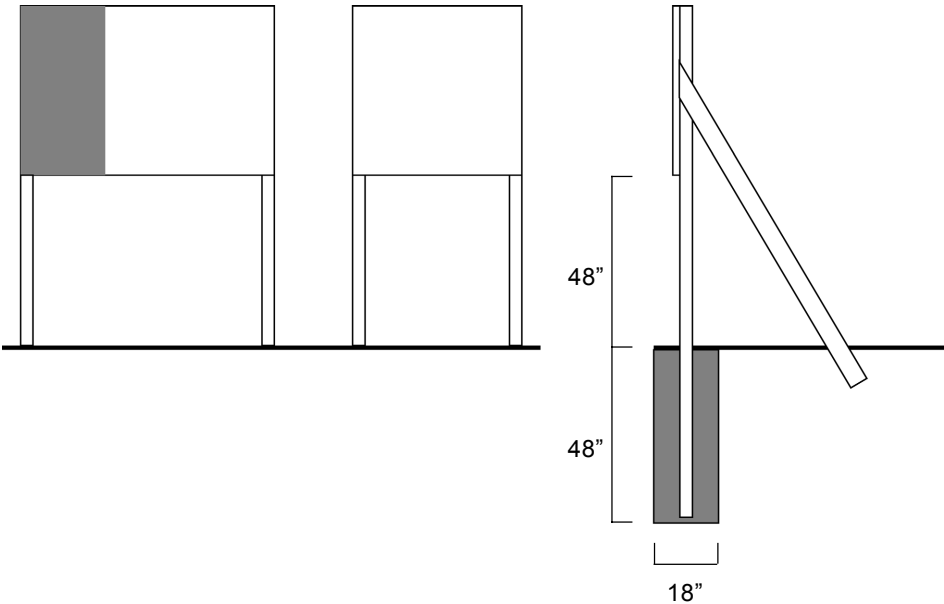
Apply graphic panel to prepared HDO plywood panel following manufacturers' instructions.

Sign uprights to be structural grade 4" x 4" treated Douglas Fir or Southern Yellow Pine, No.1 or better. Post to be 12' long. Drill six (6) .375" mounting holes in uprights to align with T-nuts in sign panel. Countersink (.5") back of hole to accept socket head cap screw (4" x .375").

Assemble sign panel and uprights. Imbed assembled sign panel and uprights in 4' hole. Local soil conditions and/or wind loading may require bolting additional 2" x 4" struts on inside face of uprights to reinforce installation as shown.

Shown below the mounting diagram is a panel layout grid with spaces provided for project information. Photocopy this page and use as a worksheet when preparing sign legend orders.

For additional information on the proper method to prepare sign panel graphics, contact the district Sign Program Manager.



Construction Project Identification Sign
Legend Group 1: Corps Relationship

- 1. _____
- 2. _____

Legend Group 2: Division/District Name

- 1. _____
- 2. _____

Legend Group 2a: Military/Civil Works Sponsor

- 1. _____
- 2. _____

Legend Group 3: Project Title

- 1. _____
- 2. _____
- 3. _____

Legend Group 4: Facility Name

- 1. _____
- 2. _____

Legend Group 5: Contractor/A&E

- 1. _____
- 2. _____
- 3. _____
- 4. _____
- 5. _____

Legend Group 5b: Contractor/A&E

- 1. _____
- 2. _____
- 3. _____
- 4. _____
- 5. _____

Safety Performance Sign
Legend Group 2: Project Title

- 1. _____
- 2. _____

Legend Group 3: Contractor/A&E

- 1. _____
- 2. _____

SECTION 01 58 10

INVESTING IN AMERICA SIGNAGE

PART 1 GENERAL

1.1 SCOPE OF WORK

Furnish all labor, equipment, materials and incidentals required to provide and erect a Bipartisan Infrastructure Law (BIL) project sign.

Provide and erect a BIL project sign meeting the requirements of this Section at a location adjacent to the EPA/USACE project site sign. The sign requirements are provided herein and on the attachment at the end of this section.

]PART 2 PRODUCTS

2.1 MATERIALS

The sign panel is to measure 72" wide by 48" tall and is to be fabricated from 0.75" High Density Overlay Plywood. Sign graphics are to be prepared on a white nonreflective vinyl film with positionable adhesive backing. All graphics on the BIL sign are to be die-cut or computer-cut nonreflective vinyl, prespaced legends prepared in the sizes and typefaces specified below and on the following attachments.

The graphic size and typefaces used on the sign are to be reproduced exactly as specified below.

Group 1: Standard one-line title "Project Funded By"
Color: Blue
Typeface: 3.5" Arial Bold, All Caps
Maximum line length: 48"

Group 2: Standard three-line title "President Joe Biden's Bipartisan Infrastructure Law"
Color: Blue
Typeface: 4.5" Arial Bold
Maximum line length: 48"

PART 3 EXECUTION

3.1 GENERAL

Prior to installing the BIL project sign on site, furnish the sign package at the location designated by the Contracting Officer. Maintain the BIL sign throughout the life of the project.

3.2 INSTALLATION REQUIREMENTS

The BIL sign is to be mounted on structural grade 4" by 4" treated Douglas Fir or Southern Yellow Pine, No. 1 or better attached to each end of the sign. Posts to be 12' long and set firmly into the ground above the prevailing grade to permit public viewing. Drill six 0.375" mounting holes in uprights to align with T-nuts in sign panel. Countersink (0.5")

back hole to accept socket head cap screw (4" X 0.375").

Assemble sign panel and uprights. Imbed assembled sign panel and uprights in 4' hole. Local soil conditions and/or wind loading may require additional 2" x 4" struts inside face of uprights to reinforce installation.

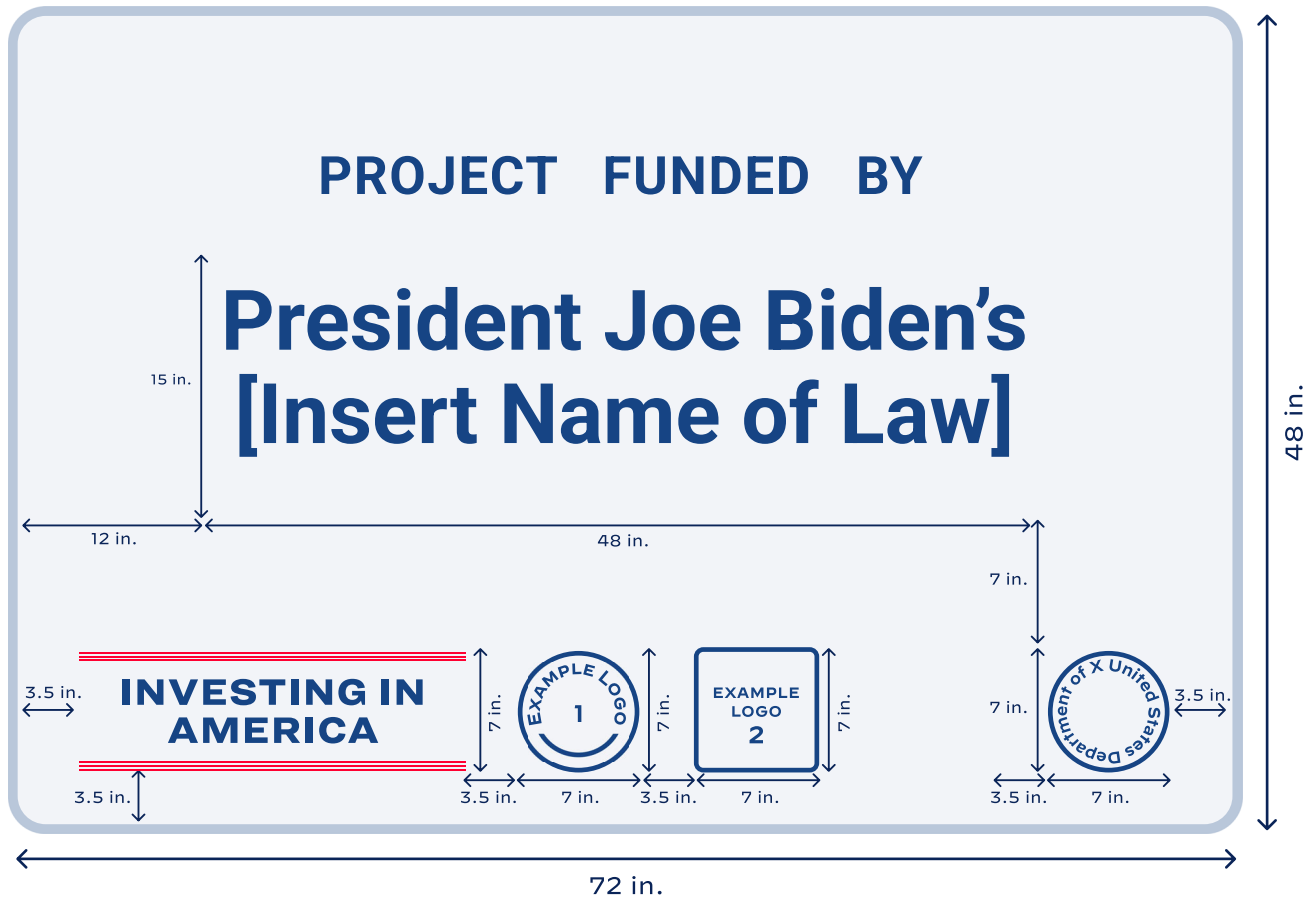
Install the signs during initial mobilization or for existing projects upon direction from the Contracting Officer.

3.3 CLOSURE REQUIREMENTS

The BIL sign is to removed from the Site after completion of the contract requirements or at the direction of the Contracting Officer.

-- End of Section --

Investing In America General Guidelines for Logo Applications



Variations and Usage




There is one approved mark associated with the Investing In America logo. To preserve the integrity of the Investing In America logo mark, make sure to apply them correctly. Altering, distorting, or recreating the ‘marks’ in any way weakens the power of the image and what it represents. Layout and design of signs and communication materials will vary, so care must be taken when applying the logo mark.

Primary Logo Mark



Colors

The colors, graphics, and fonts used should conform to graphic standards.

COLOR	CMYK	RGB	HEX	PMS
 Blue	83, 48, 0, 48	22 / 68 / 132	#164484	PMS 7687 C
 Red	0, 100, 81, 0	255 / 0 / 49	#FF0031	PMS 185 C
 White	2, 2, 0, 3	242 / 244 / 248	#F2F4F8	Bright White

PROJECT FUNDED BY

President Joe Biden's Bipartisan Infrastructure Law

**INVESTING IN
AMERICA**



U.S. ARMY



SECTION 01 71 23

SURVEYING

PART 1 GENERAL

1.1 SCOPE OF WORK

Furnish all labor, materials, equipment and incidentals required to provide surveying services prior to remedial activities, after remedial activities, and as measurement during remedial activities, including, but not limited to, the following activities:

- a. Survey groundwater screening boring locations at the site
- b. Survey all existing overburden and bedrock monitoring wells after completion of well assessment and modification as necessary
- c. Survey all newly installed overburden and bedrock monitoring wells
- d. Survey the existing conditions, utilities, surface elevation, and elevation contours of the site prior to groundwater screening and after site restoration within the construction limits defined on the Contract Drawings

Establish the exact position or location of all work control points provided by the Contracting Officer during the Pre-Construction Conference. All work must be referenced to and established from the control points, re-established where necessary and maintained throughout the life of the contract. One of the control points must be protected permanent site benchmark. Call to the Contracting Officer's attention any error or apparent discrepancies found on the Contract Drawings or Specifications for interpretation prior to proceeding with the work.

Prepare As-Built Drawings detailing the actual conditions of surface and subsurface construction upon the completion of work in accordance with SECTION 01 78 00 - CLOSEOUT SUBMITTALS.

1.2 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only. Where reference is made to one of these standards, the revision in effect at the time of contract award applies.

U.S. ARMY CORPS OF ENGINEERS (USACE)

EM 1110-1-1005

Control and Topographic Surveying

UNITED STATES FEDERAL GEODETIC CONTROL COMMITTEE (FGCC)

FGCC

Standards and Specifications for Geodetic
Control Networks

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation;

submittals with an "FIO" designation are for information only. Submit the following to the Contracting Officer in accordance with SECTION 01 33 00 - SUBMITTAL PROCEDURES.

SD-01 Preconstruction Submittals

Initial Survey Map; G

Submit an initial site survey map after surveying the site. The existing AutoCAD file for the WCC property will be provided to the Contractor. Submit an electronic copy of the survey in PDF format along with CAD files of the survey. Include the Contractor's standard title block with the surveyor's subtitle block, signature and Land Surveyor's seal. The drawing size must be 34 inches by 44 inches. Compile and digitize all survey data for use with AutoCAD 2021 or newer version, as approved by the Contracting Officer.

SD-03 Product Data

Surveyor Qualifications; FIO

Submit the name, address, New Jersey Land Surveyor registration number, and telephone number of the surveyor to the Contracting Officer before starting survey work.

Survey Accuracy Documentation; FIO

On request, submit documentation verifying accuracy of survey work to the Contracting Officer.

At the completion of each phase of work requiring services of the surveyor, submit certificates signed by the surveyor stating that elevations and locations of site construction features are in conformance, or nonconformance, with Contract Documents.

Surveyor Field Notes; FIO

On request, submit copies of the surveyor's field notes, calculations, and graphical layouts.

Survey Quantities; FIO

On request, submit certificates signed by the surveyor stating the accuracy of quantities submitted.

SD-07 Certificates

Well Certification; G

Submit Groundwater Monitoring Well Certification - Form B - Location Certification in accordance with the New Jersey Department of Environmental Protection (NJDEP), Division of Water Quality, Bureau of Ground Water, Residuals, and Permit Administration requirements. For all resurveyed wells, submit the Form B as an addendum to the existing well records.

SD-11 Closeout Submittals

Survey Points; G

Submit a tabulated delimited text or Microsoft Excel file of the survey points, shapefiles compatible with ArcGIS 10.8.2 (or most recent version) and Federal Geographic Data Committee (FGDC)-compliant metadata. Include the description, horizontal (X and Y) and vertical (Z) coordinates: elevation of ground surface and marks of well inner casing and unique point number for each point.

1.4 QUALITY CONTROL

The Contractor is responsible for all of the surveying done at the site. The surveyor must be a qualified and Registered Land Surveyor in the State of New Jersey. The Contractor's surveyor must also have a minimum of 2 years of experience in construction surveying, and layout and maintenance of As-Built Construction Drawings, with a record of performing horizontal and vertical control requirements as stated in this section.

The surveyor must check all equipment including, but not limited to electronic survey instruments, compasses, transits, and levels for accuracy and maintain records of such checks. Equipment and instrumentation must be calibrated and maintained in accordance with the manufacturer's guidelines. The surveyor must make records of the checks available to the Contractor upon request.

All survey work must be according to third-order accuracy standards as specified by the **FGCC** in the "Standards and Specifications for Geodetic Control Networks", published September 1984. The units of measure must be U.S. Survey Feet. Unless otherwise specified, monitoring well and groundwater screening locations must have a vertical precision of 0.01 feet and a horizontal precision of 0.10 feet. The highest point on the top of the riser pipe must serve as the monitoring well measuring point (for depth to water readings) and must be permanently and clearly marked.

Notify the Contracting Officer of issues that may affect quality or performance of work within 24 hours of their occurrence.

1.5 PROJECT RECORD DOCUMENTS

Maintain a complete, accurate log of control and survey work as it progresses at the work site.

Upon completion of the work, submit all record documents to the Government.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.1 INSPECTION

Verify locations of site reference and survey control points prior to starting work. Promptly notify the Contracting Officer of any discrepancies discovered.

3.2 SURVEY REFERENCE POINTS

The Contracting Officer will provide the Contractor with all site reference points during the Pre-Construction Conference.

Take all reasonable measures to protect site reference points prior to starting site work. Do not relocate reference points without prior written approval of the Government.

Immediately notify the Government of loss, damage, or destruction of any reference point, or any relocation required because of changes in grade or other reasons.

Set temporary monuments as necessary to perform the surveying. They may be wood, metal or marks scribed on permanent site features. Describe all monuments in the field notes and mark all monuments on site maps for future reference.

X, Y, and Z coordinates of benchmarks and survey control points must be determined and recorded with a maximum permissible error of 0.10 feet in any coordinate direction.

3.3 SURVEY REQUIREMENTS

3.3.1 Control Points

Establish the exact position or location of all work control points. All work must be referenced to and established from the control points, re-established where necessary and maintained throughout the life of the contract. Call any error or apparent discrepancies found in the Contract Documents to the Contracting Officer's attention for interpretation prior to proceeding with the work. Ensure the survey work performed meets the requirements below:

- a. Reference all horizontal coordinates to the New Jersey State Plane Coordinate System, NAD 1983. Reference all elevations to the NAVD 1988.
- b. The survey must be sufficient enough to generate digital topographic mapping on 1-foot contour intervals with a map scale at one inch equal to forty feet.
- c. The topographic map accuracy must meet the U.S. National Map Accuracy Standards.
- d. Perform all survey work in accordance with EM 1110-1-1005.
- e. Determine and record X, Y, and Z coordinates of survey measurements with a maximum permissible error of 0.10 feet in any coordinate direction.

3.3.2 Existing Conditions

Verify the existing conditions, contours, and locations of structures within the limits of disturbance defined on the Contract Drawings. Provide the existing conditions on the Initial Survey Map.

3.3.3 Site Features

Establish lines and levels and locate and layout by instrumentation and similar appropriate means, all site features to be constructed or executed. These include, but are not limited to, the following:

- a. Staging areas and temporary facilities layout.

- b. Access roads.
- c. Groundwater screening borings.
- d. All wells including monitoring and injection wells including the elevation of inner casing reference point, the elevation of the outer casing reference point, and the elevation of ground surface.
- e. Site features.
- f. Site ground elevation contours (in every half foot).
- g. Equipment and material decontamination area.

3.3.4 As-Built Drawings

Prepare as-built drawings in accordance with SECTION 01 78 00 - CLOSEOUT SUBMITTALS that update the design drawings establishing the as-built conditions of the DFWs and exact site restoration conditions and details upon completion of remediation, including, but not limited to, topography, monitoring wells, injection areas, and other restored areas.

-- End of Section --

SECTION 01 78 00

CLOSEOUT SUBMITTALS

PART 1 GENERAL

1.1 SCOPE OF WORK

This section outlines the requirements for the Contractor to perform closeout activities including pre-final and final inspections, certificates, reports, and determinations, and other procedures necessary for contract closeout. Inspections must be performed following the completion of construction and approval of the Contracting Officer. The work activities must include, but not be limited to, the following:

- a. Pre-final and Final Inspections
- b. Decontamination and removal of all equipment operated by the Contractor.
- c. Cleaning the project site.
- d. Disconnection of temporary utilities and removal of temporary facilities.
- e. Preparation and submittal of the construction narrative
- f. Submittal of information to the Contracting Officer to assist in the preparation of the Remedial Action Report
- g. Submittal of project record documents.

1.2 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only. Where reference is made to one of these standards, the revision in effect at the time of contract award applies.

U.S. ARMY CORPS OF ENGINEERS (USACE)

ERDC/ITL TR-19-6 A/E/C Graphics Standard - Release 2.1

ERDC/ITL TR-19-7 A/E/C CAD Standard - Release 6.1

United States Environmental Protection Agency (EPA)

OSWER Directive 9320.2-23 Close Out Procedures for National
Priorities List Sites

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals with an "FIO" designation are for information only. Submit the following to the Contracting Officer in accordance with SECTION 01 33 00 - SUBMITTAL PROCEDURES.

SD-11 Closeout Submittals

Construction Narrative Report and Data; G

Submit the the Construction Narrative Report and Data within 60 calendar days of substantial completion of each activity, as specified in Paragraph 3.6.

As-Built Drawings; G

Submit the As-Built Drawings for review in accordance with Paragraph 3.8.

Redline Documents; G

Submit the sets of red-line drawings and specifications to the Contracting Officer at the request of the Contracting Officer and at the completion of construction in accordance with Paragraph 3.7.

1.4 DEFINITIONS

1.4.1 Red-Line Drawings

Red-line Drawings are the marked-up drawings, maintained by the Contractor on-site, that depict actual conditions and deviations from the Contract Documents. These deviations and additions may result from coordination required by, but not limited to: contract modifications; official responses to submitted Requests for Information (RFI's); direction from the Contracting Officer; design that is the responsibility of the Contractor, and differing site conditions. Maintain the as-builts throughout construction as red-lined hard copies on site or red-lined PDF files. These files serve as the basis for the creation of the As-Built Drawings.

1.4.2 As-Built Drawings

The As-Built Drawings are the final compilation of actual conditions reflected in the red-line drawings.

1.5 PROJECT RECORD DOCUMENTS

Maintain accurate and comprehensive records of all site activities as well as all additions, substitutions of materials, variations in work and any other revisions to the Contract Documents.

1.5.1 Quality Control

Additions and corrections to the contract drawings must be equal in quality and detail to that of the originals. Line colors, line weights, lettering, layering conventions, and symbols must be the same as the original line colors, line weights, lettering, layering conventions, and symbols.

1.5.2 Maintenance of Project Record Documents

Maintain at the site for the Government one record copy suitable for electronic archiving of:

- a. Red-line drawings showing progress of work.

- b. Technical specifications.
- c. Addenda.
- d. Modifications to the contract.
- e. Government's directives.
- f. Written reports of any significant quality assurance problems.
- g. Progress meeting minutes.
- i. Daily work activity summary reports, including:
 - 1) Field test records.
 - 2) Photographs.
 - 3) Reports on any emergency response actions.
 - 4) Reports on all daily site activities.
 - 5) Chain-of-custody documents.
 - 6) Construction schedule and progress chart of work.
 - 7) Change orders and other modifications to the contract.
 - 8) Manufacturer's certificates.
 - 9) Manufacturer's samples.
 - 10) All laboratory analytical results.
 - 11) Meteorological records.
 - 12) All safety and accident reports.
 - 13) All spill incident reports.
 - 14) Daily construction QC reports.
 - 15) Other items as required by the Contracting Officer.

Where appropriate, one copy of all project record documents must be maintained on hard disk compatible with the Contract Officer's software.

Store project record documents and samples in the Contractor's Field Office apart from documents used for construction work.

Provide files and racks for the storage of documents; storage space that can be secured and locked; and a storage area that is clean and dry. Documents and samples should be filed to facilitate retrieval.

Make documents available at all times for inspection by the Government.

The Contractor is responsible for final handling and storage of project record documents, including boxing, labeling, and shipping to a final

destination as determined by the Contracting Officer. If approved by the Contracting Officer, the Contractor may instead scan project record documents for electronic storage to eliminate physical storage costs.

1.5.3 Red-line Documents

Keep up-to-date a complete record set of redline drawings, which must be corrected daily to show every change, and the approved shop drawings. This set must be legibly marked.

Keep up-to-date a complete set of specifications and addenda to record changes made by directive from the Contracting Officer or by change order. This set must be legibly marked.

1.6 SOURCE DRAWING FILES

The Government will provide PDF and or program files at the Pre-Construction Conference that contains one set of "as-designed" electronic CAD files in the specified software and format revised to reflect all amendments and the final contract PDF drawings. The CAD files are provided to enable preparation of as-built drawings. If discrepancies exist between the CAD files and the contract PDF drawings, correct the CAD files to show the contract PDF drawings.

1.6.1 Variation with Contract Drawings

These electronic CAD drawing files are not part of the contract documents. Differences may exist between the CAD files and the corresponding construction documents. The Government makes no representation regarding the accuracy or completeness of the electronic CAD files, nor does it make representation to the compatibility of these files with the Contractor hardware or software. In the event that a conflict arises between the signed and sealed contract documents prepared by the Government and the furnished Source drawing files, the signed and sealed contractor documents govern. The Contractor is responsible for determining if any conflict exists. Use of these Source Drawing files does not relieve the Contractor of duty to fully comply with the contract documents, including and without limitation, the need to check, confirm and coordinate the work of all contractors for the project. If the Contractor uses, duplicates or modifies these electronic source drawing files for use in producing construction data related to this contract, remove all previous indicia of ownership (seals, logos, signatures, initials and dates).

The Government has no responsibility to modify any government furnished material (FGFM) due to changes in design that occur after award. Evaluate the content and quality of the GFM upon receipt. If major discrepancies or omissions occur in the GFM, notify the Contracting Officer and indicate the nature of such variations.

1.6.2 Data Loss, Corruption, and Error

Transfer of GFM files may result in corrupted files resulting in data loss and errors. Use of GFM files is at own risk. Verify data integrity upon receipt and request a replacement if necessary. Make any adjustment in file structure, format, or software version as needed to make GFM compatible with computer systems and/or software to meet the requirements

of the contract.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.1 DECONTAMINATION

Prior to demobilization, decontaminate all contaminated material and equipment prior to final removal from the site in accordance with SECTION 01 35 29 - HEALTH, SAFETY, AND EMERGENCY RESPONSE PROCEDURES. Tools and items for which decontamination is difficult or unachievable may remain on site until completion of the work for subsequent packing and disposal by the Contractor at an approved disposal facility.

Prior to removal from the site, all decontaminated equipment and material must be inspected and approved by the SSHO and the Government. Certification of decontamination must be attested to by the SSHO.

Provide a copy of each decontamination certificate to the Government with the Construction Narrative as indicated in Paragraph 3.6. Following decontamination, remove all construction equipment operated by the Contractor from the site.

3.2 RESTORATION, CLEANUP, AND SITE CLOSURE

At the completion of the work, restore all areas affected by the construction activities to conditions equivalent to or better than the original conditions or as indicated on the Contract Drawings.

Leave premises "broom clean." Sweep paved areas and rake clean landscaped areas. Remove waste and surplus materials, rubbish and construction facilities from the site.

Vacate the site in an orderly manner and to the satisfaction of the Contracting Officer. Keys must be turned over to the Contracting Officer during project closeout.

3.3 PRE-FINAL INSPECTION

The Contracting Officer and the Contractor will conduct a Pre-Final Inspection of the treatment system and restored area in accordance with SECTION 01 45 00.00 - CONTRACTOR QUALITY CONTROL. The work is considered substantially complete at the time of the Pre-Final Inspection.

3.4 SUBSTANTIAL COMPLETION

The Contracting Officer will prepare a Certificate of Substantial Completion when they find the work to be substantially complete. The Certificate of Completion will include a list of deficiencies that require timely correction and/or non-construction deficiencies in accordance with provisions of General Conditions.

3.5 FINAL ACCEPTANCE INSPECTION

The Contracting Officer and the Contractor will conduct a Final Inspection of the restored area in accordance with SECTION 01 45 00.00 - CONTRACTOR QUALITY CONTROL. The Contracting Officer will verify that all deficiencies identified during the Pre-Final Inspection have been addressed. The

Contracting Officer will prepare a list of any outstanding deficiencies that require timely correction and/or non-construction deficiencies in accordance with provisions of General Conditions.

3.6 CONSTRUCTION NARRATIVE REPORT AND DATA

Provide a narrative report and data to the Government, including, but not limited to, the following, within 60 calendar days of completion of each activity, for preparation of the Remedial Action Report. Prepare the report in accordance with **OSWER Directive 9320.2-23** Exhibit 2-5. This is to include, but not be limited to, information on the following activities:

- a. Site background
- b. Site preparation activities, including construction of staging area, temporary facilities, clearing as necessary, construction of decontamination pad, and construction of temporary access road
- c. Construction activities, including the following:
 1. Groundwater screening
 2. Well installation
 3. Synoptic water level measurements
 4. Groundwater sampling
 5. Amendment injection
 6. Environmental sampling methods and data
 7. Waste characterization activities
 8. Handling, transportation, and off-site disposal
- d. Off-site disposal of all waste types including copies of all manifests and land disposal restriction notifications, copies of all certifications of final disposal signed by the responsible disposal facility official, and copies of waste profile sheets.
- e. Sampling results, including collection data such as date and time of collection, sample chain-of-custody forms, and field measurements.
- f. Amendment injection records, including the injection rate, groundwater extraction rate, measurements and sample results collected during injection, total volume injected at each injection well, amendment usage.
- g. Removal of temporary facilities and demobilization.
- h. Copies of all decontamination certifications.
- i. Progress photographs in accordance with **SECTION 01 30 00 - ADMINISTRATIVE REQUIREMENTS** and progress videos in accordance with **SECTION 01 32 36 - VIDEO MONITORING AND DOCUMENTATION**.
- j. Copies of all permits.

- k. List of chronological events.
- l. All inspection and certification reports including punch list items for Pre-Final and Final Inspections.
- m. As-built drawings.
- n. Construction logs.
- o. List of subcontractors with subcontract value.
- p. Performance standards and CQC.
- q. Copies of executed work variation notifications.
- r. Summary of any significant problems or deviations from the ROD.
- s. Observations and lessons learned.
- t. Summary of sustainability practices including quantity, facilities, etc.
- u. Contact information.

3.7 RED-LINE DRAWINGS

Provide and maintain two black line print copies of the PDF Contract Drawings for Red-line Drawings. Maintain the Red-line Drawings throughout construction.

All horizontal coordinates must be referenced to the New York State Plane Coordinate System, North American Datum (NAD) 1983. All elevations must be referenced to the North American Vertical Datum (NAVD) 1988.

3.7.1 Markup Guidelines for Red-line Drawings

Make comments and markup the drawings complete without reference to letters, memos, or materials that are not part of the Contract Drawing. Show what was changed, how it was changed, where item(s) were relocated and change related details. These working red-line drawings must be neat, legible and accurate as follows:

- a. Use base colors of red, green, and blue. Color code for changes as follows:
 - (1) Special (Blue) - Items requiring special information, coordination, or special detailing or detailing notes.
 - (2) Deletions (Red) - Over-strike deleted graphic items (lines), lettering in notes and leaders.
 - (3) Additions (Green) - Added items, lettering in notes and leaders.
- b. Provide a legend if colors other than the "base" colors of red, green, and blue are used.
- c. Add and denote any additional equipment or material facilities, service lines, incorporated under As-Built Revisions if not already shown in legend.

- d. Use frequent written explanations on markup drawings to describe changes. Do not totally rely on graphic means to convey the revision.
- e. Use legible lettering and precise and clear digital values when marking prints. Clarify ambiguities concerning the nature and application of change involved.
- f. Wherever a revision is made, also make changes to related section views, details, legend, profiles, plans and elevation views, schedules, notes and call out designations, and mark accordingly to avoid conflicting data on all other sheets.
- g. For deletions, cross out all features, data and captions that relate to that revision.
- h. For changes on small-scale drawings and in restricted areas, provide large-scale inserts, with leaders to the applicable location.
- i. Indicate one of the following when attaching a print or sketch to a markup print:
 - 1) Add an entire drawing to Contract Drawings.
 - 2) Change the Contract Drawing to show changes on the drawing.
 - 3) Provided for reference only to further detail the initial design.
- j. Incorporate all shop and fabrication drawings into the red-line drawings.

3.7.2 Red-Line Drawings Content

Prepare As-Built Drawings from Red-lined Drawings in accordance with [ERDC/ITL TR-19-6](#) and [ERDC/ITL TR-19-7](#). Changes from the Contract Drawings which are made during construction or additional information which might be uncovered in the course of construction must be accurately and neatly recorded as they occur by means of details and notes. Show on the red-line drawings, but not limited to, the following information:

- a. The actual location, kinds and sizes of all sub-surface utility lines. In order that the location of these lines and appurtenances may be determined in the event the surface openings or indicators become covered over or obscured, show by offset dimensions to two permanently fixed surface features the end of each run including each change in direction on the record drawings. Record the average depth below the surface of each run.
- b. Layout and schematic drawings of electrical circuits and piping.
- c. Correct grade, elevations, cross section, or alignment of roads, earthwork, structures or utilities if any changes were made from contract plans.
- d. Changes in details of design or additional information obtained from working drawings specified to be prepared or furnished by the Contractor; including but not limited to shop drawings, fabrication, erection, installation plans and placing details, pipe sizes, insulation material, dimensions of equipment, and foundations.

- e. The topography, invert elevations and grades of drainage installed or affected as part of the project construction.
- f. Changes or Revisions which result from the Final Inspection.
- g. Where Contract Drawings or Specifications present options, show only the option selected for construction on the working red-line drawings.
- h. Modifications.
- i. Actual location of anchors, construction and control joints, etc., in concrete.
- j. Unusual or uncharted obstructions that are encountered in the contract work area during construction.
- k. Location, extent, thickness, and size of stone protection particularly where it is normally submerged by water.

3.7.3 Additional Drawings

If additional drawings are required for the Red-line Drawings (and subsequent As-Built Drawings), prepare them using the specified electronic file format applying the same graphic standards specified for original drawings. The title block and drawing border to be used for any new final record drawings must be identical to that used on the contract drawings. Accomplish additions and corrections to the contract drawings using CAD files. Provide all program files and hardware necessary to prepare final PDF record drawings. The Contracting Officer will review final PDF record drawings for accuracy and return them to the Contractor for required corrections, changes, additions, and deletions.

If a sheet needs to be added between two sequential sheets, append a Supplemental Drawing Designator in accordance with [ERDC/ITL TR-19-7](#) Adding a drawing sheet, and [ERDC/ITL TR-19-6](#) Adding or deleting drawing sheets and index sheet procedures.

Rename the CAD Drawing files using the contract number as the Project Code field, as instructed in the Pre-Construction conference. Use only those renamed files for the marked-up changes. Make all changes on the layer/level as the original item.

When final revisions have been completed, show the wording "RECORD DRAWING AS-BUILTS" followed by the name of the Contractor in letters at least [3/16 inch](#) high on the cover sheet drawing. Date RECORD DRAWING AS-BUILTS drawing revisions in the revision block.

3.8 AS-BUILT DRAWINGS

Prepare final As-Built Drawings using the Red-line Drawings after the completion of each definable feature of work as listed in the CQC Plan, as appropriate for the project and in accordance with [ERDC/ITL TR-19-6](#) and [ERDC/ITL TR-19-7](#). Transfer the changes from the approved Red-line Drawings to the original electronic CAD drawing files. Modify the red-line CAD drawing files to correctly show the features of the project as-built by bringing the working CAD drawing set into agreement with approved Red-line Drawings, and adding such additional drawings as may be necessary. Refer to [ERDC/ITL TR-19-6](#). Jointly review the Red-line Drawings with printouts

from red-line CAD drawing PDF files for accuracy and completeness. These PDF drawing files are part of the permanent records of this project. Any drawings damaged or lost must be satisfactorily replaced.

Prepare the CAD drawing files in AutoCAD Release 2021 format compatible with a Windows 10 operating system.

Drawing revisions must comply with the following procedures.

- a. Follow directions in the revision for posting descriptive changes.
- b. The revision delta size must be $\frac{5}{16}$ inch unless the area where the delta is to be placed is crowded. Use a smaller size delta for crowded areas.
- c. Place a revision delta at the location of each deletion.
- d. For new details or sections which are added to a drawing, place a revision delta by the detail or section title.
- e. For minor changes, place a revision delta by the area changed on the drawing (each location).
- f. For major changes to a drawing, place a revision delta by the title of the affected plan, section, or detail at each location.
- g. For changes to schedules or drawings, place a revision delta either by the schedule heading or by the change in the schedule.

3.8.1 Final As-Built Drawing Package

Submit the final as-built PDF and CAD drawings package for the entire project within 20 days of substantial completion of all phases of work. Submit one set of ANSI D size PDF and CAD files of the As-Built Drawings and one set of the approved Red-Line Drawings. The As-Built Drawings submittal must include the Contractor's standard title block with the surveyor's subtitle block, signature and Land Surveyor's seal. The package must be complete in all details and identical in form and function to the contract drawing files supplied by the Government.

As-Built Drawings must be submitted for the site and any areas within adjacent properties disturbed by the Contractor. The cut lines must be discussed with the Contracting Officer prior to performing the work. All survey data must be compiled and digitized for use with AutoCAD 2021 or newer version. A tabulated delimited text or excel file of the survey points must also be submitted. The file must include the description, horizontal and vertical coordinates, Z elevation (when applicable) and unique point number for each point. All survey work must be performed in accordance with SECTION 01 71 23 - SURVEYING.

3.9 FINAL ACCEPTANCE

Prior to Final Inspection, submit a list of completed final clean-up activities to the Government. The Contractor and the Government must jointly perform a Final Acceptance Inspection, which must include an inspection of the Site to ensure that all work was completed as outlined in the Contractor's list of final clean-up activities in SECTION 01 11 00 - SUMMARY OF WORK and SECTION 01 45 00.00 - CONTRACTOR QUALITY CONTROL. Address any deficiencies immediately.

White Chemical Corporation Superfund Site, OU3
Final 100% Remedial Design

When the Contracting Officer finds work is complete, they will consider closeout submittals, and a Final Acceptance Certificate must be issued to the Contractor. Upon receiving the Final Acceptance Certificate, submit the final invoice for payment.

-- End of Section --

SECTION 01 80 00

PERFORMANCE SAMPLING AND ANALYSIS

PART 1 GENERAL

1.1 SCOPE OF WORK

Furnish all labor, materials, equipment and incidentals necessary to provide the sampling and analysis activities specified herein. The purpose of these activities is to evaluate the effectiveness of in situ bioremediation and to facilitate adaptive management of site remediation.

The groundwater sample collection consists of the following work items:

- a. Baseline and four rounds of performance monitoring of all existing and newly installed overburden wells. A fifth round of performance monitoring may be performed, as directed by the Contracting Officer.
- b. Baseline and three rounds of performance monitoring of existing bedrock wells and four newly installed bedrock wells.

Perform the baseline sampling of bedrock wells in conjunction with the baseline sampling of the overburden monitoring wells.

Collect synoptic water level measurement as specified herein.

1.2 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only. Where reference is made to one of these standards, the revision in effect at the time of contract award shall apply.

U.S. ENVIRONMENTAL PROTECTION AGENCY (EPA)

EQASOP-GW4

Low Stress (Low Flow) Purging and Sampling
Procedure for the Collection of
Groundwater Samples from Monitoring Wells

NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION

NJDEP FSPM

Field Sampling Procedures Manual

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals with an "FIO" designation are for information only. Submit the following to the Government in accordance with SECTION 01 33 00 - SUBMITTAL PROCEDURES.

SD-06 Test Reports

Preliminary Data Submittal; G

Submit preliminary VOC and TOC data in a spreadsheet within 72 hours after its collection. At the same time, also compile and

submit the well purging measurements, such as pH, conductivity, DO, ORP in a spreadsheet. Discuss the results during the next project progress conference call.

Validated Data Submission; G

Submit validated data in EDD format as required in SECTION 01 35 45 - CHEMICAL DATA QUALITY CONTROL and in a Microsoft (MS) Excel table summarizing all the detections. The data quality must meet the requirements specified in SECTION 01 35 45 - CHEMICAL DATA QUALITY CONTROL.

Synoptic Water Level Measurements; G

Submit synoptic water level measurement results within 10 business days after the completion of each synoptic water level measurement event in an MS Excel format. The water level measurement spreadsheet must include well identification number, recorded date and time data, total depth of the well, depth to water, surveyed elevation of reference point (i.e. top of inner casing), photoionization detector (PID) reading at the well head after immediately opening the well cap, and a note of any field observations.

1.4 QUALITY ASSURANCE

1.4.1 UFP-QAPP

Analytical sampling must be performed as detailed in the Contractor's approved UFP-QAPP, which is developed and submitted for approval in accordance with SECTION 01 35 45 - CHEMICAL DATA QUALITY ASSURANCE.

1.4.2 Qualifications

All groundwater samplers must have at a minimum 6 months of experience performing groundwater sampling using NJDEP FSPM or EQASOP-GW4.

1.5 DELIVERY, STORAGE, AND HANDLING

All equipment and materials to be used must be properly protected so that no damage, deterioration, or contamination occurs from time of shipment until the work is completed.

Chemicals to be used during each sampling event must be properly stored and handled to meet the requirements in the approved Accident Prevention Plan (APP) and SECTION 01 35 29 - HEALTH, SAFETY AND EMERGENCY RESPONSE PROCEDURES.

1.6 HEALTH AND SAFETY

perform groundwater sampling related activities in accordance with the requirements in the approved APP and SECTION 01 35 29 - HEALTH, SAFETY AND EMERGENCY RESPONSE PROCEDURES.

1.7 PROTECTION FROM DAMAGE

Protect all surface features and surrounding areas from damage that may result from the methods employed in performing the work. The Contractor must be responsible for any damages resulting from his operations. Damage

to property must be repaired or replaced to the existing conditions, as approved by the Contracting Officer.

PART 2 PRODUCTS

2.1 EQUIPMENT

All sampling equipment must meet the requirements of the approved Uniform Federal Policy Quality Assurance Project Plan (UFP-QAPP). Equipment to be used must also be in compliance with EQASOP-GW4 and meet the requirements of NJDEP FSPM.

2.2 BOTTLEWARE

Use bottleware in accordance with the approved UFP-QAPP.

PART 3 EXECUTION

3.1 GROUNDWATER SAMPLE COLLECTION

3.1.1 General

Analyze baseline groundwater samples and post-injection samples for all parameters specified in Tables 01 80 00-1 and 01 80 00-2 in accordance with SECTION 01 35 45 - CHEMICAL DATA QUALITY CONTROL.

Be aware that the groundwater from the monitoring wells after amendment injection is expected to have increased biodegradation activity, which will cause effervescence in the groundwater samples. This will require that samples collected after amendment injection for VOC and TOC analysis be unpreserved. Coordinate with an offsite laboratory to analyze the samples within 24 hours after receiving the samples due to the potential of effervescing.

Requirements for data quality are specified in SECTION 01 35 45 - CHEMICAL DATA QUALITY CONTROL.

Follow the laboratory booking procedure specified in SECTION 01 35 45 - CHEMICAL DATA QUALITY CONTROL.

3.1.2 Overburden Performance Monitoring

Collect groundwater samples from overburden monitoring wells in each particular treatment zone shown on the Contract Drawings in accordance with the injection schedule of that treatment zone. The anticipated sampling events for overburden performance sampling include the following:

- a. Baseline groundwater sampling event - two weeks after well development, samples must be collected in one sampling event
- b. Round 1 - 6 months after the initial amendment injection
- c. Round 2 - 15 months after the initial amendment injection
- d. Round 3 - 24 months after the initial amendment injection
- e. Round 4 - 6 months after the second amendment injection, or 33 months after the initial amendment injection if a second injection event is not conducted

- f. Round 5 - 12 months after the second amendment injection, or not performed if a second injection event is not conducted

The list of overburden wells for each groundwater sampling event is provided in Table 01 80 00-1. Well locations are shown on the Contract Drawings. The actual time of the Round 4 and Round 5 sampling events may be adjusted based sampling results from Rounds 2 and 3. If a second injection event is conducted, Rounds 4 and 5 sampling events must be conducted 6 months and 12 months after the second injection event. If a second injection event is not conducted, the Round 4 event must be conducted 33 months after the initial amendment injection and Round 5 would not be conducted, as directed by the Contracting Officer.

3.1.3 Bedrock Performance Monitoring

A summary of bedrock well sample collection and analyses are provided in Table 01 80 00-2. Collect groundwater samples from the bedrock monitoring wells 6, 15, and 24 months following completion of the bedrock injections. The baseline bedrock sampling event must be conducted simultaneously with the overburden baseline sampling event.

3.2 SYNOPTIC WATER LEVEL MEASUREMENTS

Collect synoptic water level measurements from all wells listed in Table 01 80 00-3 within an 8-hour timeframe, once per year during the duration of the performance sampling and during each performance monitoring event. The first round of synoptic water level measurements must be completed immediately before the baseline sampling event. Five rounds of annual synoptic water level measurements are included in this design. A field form demonstrating the data to be recorded in the field for synoptic water level measurements must be included in the UFP-QAPP for approval.

3.3 FIELD MEASUREMENTS

During low flow groundwater sampling, collect field purging parameters including pH, conductivity, oxidation-reduction potential (ORP), temperature, dissolved oxygen (DO), and turbidity. Use a DO probe because it can measure to 0.1 mg/L and experiences very little calibration drift while steady state electrochemical sensors require a calibration each day. Groundwater samples must be collected after water quality parameters were stabilized for three consecutive readings as follows: ± 0.3 feet for drawdown, ± 0.1 for pH; ± 3 percent for specific conductivity; ± 10 mV for ORP, and ± 10 percent for DO (± 0.1 mg/L for DO less than 1 mg/L).

Analyze ferrous iron in the field (Table 01 80 00-1) as soon as possible after sample collection, no more than 4 hours. The bottles for ferrous iron samples must have zero headspace.

Properly calibrate all field instruments for water quality measurements. Document the calibration and make documentation available for review by the Contracting Officer's field representative.

3.4 LABORATORY SAMPLE ANALYSIS

Analyze groundwater samples for the parameters listed in Table 01 80 00-1 in accordance with the Contractor's approved UFP QAPP and SECTION 01 35 45 - CHEMICAL DATA QUALITY CONTROL

3.5 INVESTIGATION DERIVED WASTE (IDW)

Properly contain and dispose of the IDW generated during groundwater sampling events in accordance with SECTION 02 81 00 - TRANSPORTATION AND DISPOSAL OF WASTE MATERIAL.

-- End of Section --

Table 01 80 00-1

Overburden Performance Monitoring Wells and Analysis Parameters

White Chemical Corporation Superfund Site, OU3 RD

Newark, New Jersey

Well ID	Screen Interval (feet bgs) subject to change	Rounds Sampled for Each Analysis																																															
		VOCs*					MEE					TOC *					Sulfate					QuantArray					Ferrous iron****																						
		Baseline	Round 1	Round 2	Round 3	Round 4	Round 5**	Baseline	Round 1	Round 2	Round 3	Round 4	Round 5**	Baseline	Round 1	Round 2	Round 3	Round 4	Round 5**	Baseline	Round 1	Round 2	Round 3	Round 4	Round 5**	Baseline	Round 1	Round 2***	Round 3***	Round 4	Baseline	Round 1	Round 2	Round 3	Round 4	Round 5**													
Existing Overburden Wells - WCC Property																																																	
MW-2	7-17	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x																									
MW-2D	33-43	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x																									
MW-3S	7-17	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x																									
MW-3D	36-41	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x																									
MW-4	8-18	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x																									
MW-6	7-17	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x																									
MW-6D	24-34	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x																									
MW-7S	7-17	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x																									
MW-7D	24-29	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x																									
MW-22S	17-27	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x																									
MW-22D	28.5-38.5	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x																									
MW-23I	22-32	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x																									
MW-23D	34-44	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x																									
MW-24S	15-25	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x																									
MW-24D	25.5-35.5	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x																									
MW-25I	22-32	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x																									
MW-25D	34-44	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x																									
MW-26I	15-25	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x																									
MW-26D	24.5-34.5	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x																									
MW-27I	17.2-27.2	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x																									
MW-27D	34-44	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x																									
MW-28I	16.7-26.7	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x																									
MW-28D	34-44	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x																									
Proposed Overburden Wells - WCC Property																																																	
MW-1I	25-35	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x																									
MW-2I	21-31	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x																									
MW-3I	25-35	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x																									
MW-101I	16-26	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x																									
MW-101D	28-38	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x																									
MW-102I	10-20	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x																									
MW-102D	20-30	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x																									
MW-103I	11-21	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x																									
MW-103D	22-32	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x																									
MW-104I	12-22	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x																									
MW-104D	23-33	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x																									
MW-105I	18-28	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x																									
MW-105D	30-40	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x																									
MW-106I	18-28	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x																									
MW-106D	30-40	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x																									
MW-107I	11-21	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x																									
MW-107D	23-33	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x																									
MW-108I	15-25	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x																									
MW-108D	25-35	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x																									
MW-109I	20-30	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x																									
MW-109D	33-43	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x																									
MW-110I	20-30	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x																									
MW-110D	33-43	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x																									
MW-111I	20-30	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x																									
MW-111D	33-43	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x																									

Table 01 80 00-1

Overburden Performance Monitoring Wells and Analysis Parameters

White Chemical Corporation Superfund Site, OU3 RD

Newark, New Jersey

Well ID	Screen Interval (feet bgs) subject to change	Rounds Sampled for Each Analysis																																			
		VOCs*						MEE						TOC *						Sulfate						QuantArray					Ferrous iron****						
		Baseline	Round 1	Round 2	Round 3	Round 4	Round 5**	Baseline	Round 1	Round 2	Round 3	Round 4	Round 5**	Baseline	Round 1	Round 2	Round 3	Round 4	Round 5**	Baseline	Round 1	Round 2	Round 3	Round 4	Round 5**	Baseline	Round 1	Round 2***	Round 3***	Round 4	Baseline	Round 1	Round 2	Round 3	Round 4	Round 5**	
Existing Overburden Wells - 646 Frelinghuysen Property																																					
MW-14S	10-20	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x					x	x		x			
MW-14D	26-36	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x			***	***			x	x		x		
MW-16D	24-34	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x						x	x		x			
Proposed Overburden Wells - 646 Frelinghuysen Property																																					
MW-201D	23-33	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x						x	x		x			
MW-202D	24-34	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x						x	x		x			
MW-203D	27-37	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x						x	x		x			
MW-204D	25-35	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x						x	x		x			

Notes:

bgs - below ground surface

ID - identification

MEE - methane, ethane, ethene

TOC - total organic carbon

VOCs - volatile organic compounds

WCC - White Chemical Corporation

x - indicates sample must be collected from the well

* Rounds 1, 2, 3, 4, and 5 require analysis within 24 hours for VOC and TOC analysis due to effervescence as a result of biological activity.

** Round 5 performance monitoring to be determined and only performed as directed by the Contracting Officer.

*** QPCR to be performed in approximately 25% of the monitoring wells during Round 2 and Round 3 performance monitoring events. List of wells to be determined.

**** Ferrous iron screening to be conducted in the field.

All analysis to be performed with 7 day turnaround time except for VOC and TOC analysis, which is to be performed for 3 day turnaround time.

Table 01 80 00-2

Bedrock Performance Monitoring Wells and Analysis Parameters

White Chemical Corporation Superfund Site, OU3 RD

Newark, New Jersey

Well ID	Screen Interval (feet bgs)	Rounds Sampled for Each Analysis																			
		VOCs*#				MEE				TOC *				Sulfate				QuantArray-Chlor			
		Baseline	Round 1	Round 2	Round 3	Baseline	Round 1	Round 2	Round 3	Baseline	Round 1	Round 2	Round 3	Baseline	Round 1	Round 2	Round 3	Baseline	Round 1	Round 2**	Round 3
Existing Bedrock Wells - WCC Property																					
MW-1B1	73-83	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		**	
MW-1B2	95-100	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x			
MW-3B1	52-62	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x			
MW-6B1	42-52	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x			
MW-6B2	85-95	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x			
MW-6B3	114-124	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x			
MW-6B4	155-165	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x			
Existing Bedrock Wells - 646 Frelinghuysen Property																					
MW-16B1	43-53	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		**	
MW-16B2	77-87	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x			
Proposed Bedrock Wells - WCC Property																					
MW-109B1	52-62	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		**	
MW-109B2	90-100	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x			
MW-110B1	52-62	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x			
MW-110B2	90-100	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x			

Notes:

bgs - below ground surface

ID - identification

MEE - methane, ethane, ethene

TOC - total organic carbon

VOCs - volatile organic compounds

WCC - White Chemical Corporation

x - indicates sample shall be collected from the well

Well screen intervals for the proposed monitoring wells are subject to change based on installation of the monitoring wells.

VOCs analysis to include TAL VOCs and 1-bromo-2-chloroethane.

* TAL VOCs (and 1-bromo-2-chloroethane) and TOC must be analyzed within 24 hours due to effervescence as a result of biological activity.

** QPCR to be performed in approximately 25% of the monitoring wells during Round 2 performance monitoring event. List of wells to be determined.

All analysis to be performed with 7 day turnaround time except for VOC and TOC analysis, which is to be performed for 3 day turnaround time.

Table 01 80 00-3

Wells for Synoptic Water Level Measurements

White Chemical Corporation Superfund Site, OU3 RD

Newark, New Jersey

Well ID	Depth (feet bgs)	Screened Interval (feet bgs)	Top of Inner Casing Elevation (feet amsl)
MW-1S	20.09	7-17	17.08
MW-1D	48.32	40-45	15.55
MW-1B1	86.21	73-83	16.40
MW-1B2	104.50	95-100	16.39
MW-2	19.25	7-17	18.37
MW-2D	45.28	33-43	18.26
MW-3S	20.52	7-17	18.22
MW-3D	44.28	36-41	18.39
MW-3B1	63.76	52-62	18.32
MW-4	21.20	8-18	19.22
MW-5S	17.90	7-17	17.28
MW-5D	31.14	24-29	17.14
MW-6	17.30	7-17	19.57
MW-6D	35.8	24-34	20.03
MW-6B1	53.8	42-52	20.08
MW-6B2	96.0	85-95	20.08
MW-6B3	121.05	114-124	19.95
MW-6B4	168.5	155-165	19.99
MW-7S	18.97	7-17	19.03
MW-7D	32.12	24-29	18.47
MW-22S	27.51	17-27	19.36
MW-22D	38.61	28.5-38.5	19.05
MW-23I	27.95	22-32	19.27
MW-23D	45.81	34-44	18.99
MW-24S	26.74	15-25	21.67
MW-24D	36.4	25.5-35.5	21.97
MW-25I	33.0	22-32	21.36
MW-25D	46.2	34-44	21.37
MW-26I	25.36	15-25	19.52
MW-26D	35.78	24.5-34.5	19.86
MW-27I	27.80	17.2-27.2	19.81
MW-27D	43.70	34-44	19.75
MW-28I	28.40	16.7-26.7	20.43
MW-28D	45.40	34-44	20.54
MW-14S	18.72	10-20	18.95
MW-14D	35.42	26-36	19.00
MW-16D	28.74	24-34	18.36
MW-16B1	53.15	43-53	18.10
MW-16B2	87.35	77-87	18.21
Wells to be installed*			
MW-1I	35	25-35	TBD
MW-2I	31	21-31	TBD
MW-3I	35	25-35	TBD
MW-101I	26	16-26	TBD
MW-101D	38	28-38	TBD
MW-102I	20	10-20	TBD
MW-102D	30	20-30	TBD
MW-103I	21	11-21	TBD
MW-103D	32	22-32	TBD

SECTION 01 85 10

WELL MAINTENANCE PROGRAM

PART 1 GENERAL

1.1 SCOPE OF WORK

Implement a Well Maintenance Program for all monitoring wells.

Furnish all required labor, chemicals, equipment and incidentals, whether specified herein or not, to successfully implement the well maintenance program. Have a thorough understanding of the regulations and the environmental implications associated with the well maintenance program and associated treatment practices.

The well maintenance program must address any deterioration of the wells observed during monitoring well sampling. The program must emphasize rehabilitating and restoring monitoring wells to an acceptable performance for performance monitoring sampling.

Reasons for reduced performance can include biofouling and mineralogical incrustation caused by the groundwater chemistry change due to the injection of amendment near the monitoring wells.

Record water level drawdown measurements for each monitoring well during the baseline and performance monitoring sampling events. During the initial baseline event, determine the optimal purge rate for each well according to low-flow sampling procedures (i.e., the rate at which the drawdown does not exceed 0.3 feet, with a maximum flow rate of 500 milliliters per minute). During subsequent performance monitoring events, measure the drawdown and record the pre-determined optimal purge rate. During subsequent performance monitoring events, if the well drawdown exceeds the requirements for low-flow sampling (drawdown less than 0.3 feet, with a maximum flow rate of 500 milliliters per minute), redevelop and bail all accumulated sediment from the well.

Record the depth to the bottom of the monitoring wells during each monitoring event to document sedimentation that may occur on the bottom of the well. If the depth to the bottom increases by one foot, redevelop the well.

The Contractor must provide its own electrical power and necessary potable water for any well maintenance operations.

The Contractor is responsible for protection and security of their equipment on site.

Well construction details and requirements are presented in the Contract Drawings and SECTION 33 51 39 - MONITORING WELLS.

Requirements for offsite transportation and disposal of investigation derived waste are presented in SECTION 02 81 00 - TRANSPORTATION AND DISPOSAL OF WASTE MATERIAL.

Perform the well maintenance operation in accordance with requirements in SECTION 01 35 29 - HEALTH, SAFETY AND EMERGENCY RESPONSE PROCEDURES.

1.2 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only. Where reference is made to one of these standards, the revision in effect at the time of contract award applies.

ASTM INTERNATIONAL (ASTM)

ASTM D5978-96

Maintenance and Rehabilitation of
Groundwater Monitoring Wells

1.3 SUBMITTALS

Contracting Officer approval is required for submittals with a "G" designation; submittals having an "FIO" designation are for information only. The following must be submitted in accordance with SECTION 01 33 00 - SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Well Maintenance Work Plan; G

Within 30 days after completion of the well condition assessment, submit the well maintenance work plan for review. Propose methods to be used in monitoring and maintaining the monitoring wells. Mechanical surging and pumping and high pressure jetting techniques are acceptable methods for redeveloping the wells. Chemical treatment, while also acceptable, will require approval by the Contracting officer and must only be used after mechanical methods have failed to redevelop the well.

For chemical treatments, the Contractor must consider the recommendations provided by the Environmental Security and Technology Certification Program (ESTCP) Project ER-0429, 2005 in developing the well maintenance program. Any chemical added to maintain the well must not adversely impact the anaerobic biodegradation of site contaminants generated by the lactate and bicarbonate. A few chemicals were identified as promising biofouling controls for groundwater applications, including chlorine dioxide, NaOCl, glycolic acid, and the addition of carbon dioxide (Aqua Freed®). Other well maintenance measures may also be proposed. The well maintenance program must be approved by the Contracting Officer prior to its use for well maintenance.

SD-03 Product Data

Chemical Data Sheet; G

Submit the specification of chemicals to be used to maintain the monitoring wells.

SD-05 Design Data

Well Maintenance Record/Log; G

Submit the well maintenance record/logs at the completion of each well maintenance event. Records/logs need to include all aspects

of the rehabilitation process from the determination that the well was deteriorating through confirmation, selection and application of the treatment to post-treatment confirmation of the effectiveness of the treatment.

These records/logs must include details of the precise nature of the rehabilitation treatment employed including the type and amount of chemicals used, the sequences in which they were applied, any use of heat or pressures as a part of the treatment and the surging method(s) selected. All of these must be set out chronologically in sequence and confirmed in writing. Well maintenance record/logs must also include any measurements taken in relation to the maintenance of the specific well.

1.4 QUALITY ASSURANCE

Provide standard equipment modified as required and manufactured by companies whose products have commercially available replacement parts and have had similar units in service for not less than 5 years.

1.5 PERMITS

The Contractor is responsible for obtaining all necessary permits for the well maintenance in accordance with Federal, State and local regulatory requirements, including the NJDEP Permit Equivalent for Remediation Discharges to Groundwater.

1.6 TOOLS, SPARE PARTS AND SUPPLIES

Keep sufficient tools, spare parts and supplies necessary for well maintenance. Down time due to equipment failure should be avoided and the Contractor must bear the costs associated with downtime due to equipment failure. All tools used in the well maintenance operation must be suitable to the needs of the treatment. They must be corrosion resistant and kept clean and free from unnecessary grime, grease, and evidence of corrosion.

1.6.1 Pumping Equipment

Chemical treatments may involve aggressive chemistry, possibly along with heat, thus the pumps need to be resistant to corrosion and made of durable materials (e.g., high-grade stainless steel and/or heat and chemical resistant plastics). All connectors for electrical supplies as well as those supplying chemical solutions shall be robust and durable under the extreme conditions expected to occur during the well maintenance operation.

1.6.2 Spare Parts

Keep spare parts on-hand at all times during the treatment process to ensure minimal delays in the event of process failure. Spare parts must include all items that are likely to fail in less than 500 hours of operation and items known to be in the latter third of their active working life. These spare parts must include all relevant valves, pumps, electrical relays, monitoring equipment (including pH, ORP and temperature probes), pipes, and fittings.

1.6.3 Chemical Mixing and Injecting Equipment

All equipment for mixing and the injection of chemicals must be in good operating conditions with a minimal risk of failure due to carelessness,

inadequate specifications, improper maintenance and inappropriate use. The selection of this equipment shall meet the needs and expectation of all entities involved in the well maintenance program.

1.6.4 Chemical Supplies

Obtain chemical supplies from reputable suppliers who can provide the appropriate safety data sheet (SDS) forms for the chemicals. Transportation and storage must follow the recommended guidelines and particular care should be taken to ensure that potentially antagonistic chemicals are not stored in close proximity. Take care to ensure that all of the chemicals used in a treatment must be within their expiration date. It is recommended that 15% more chemicals than directly required for a treatment be kept on-hand to ensure that an effective treatment can be achieved in the event of leakage or spillage.

1.6.5 Safety Equipment

All relevant safety equipment to handle the various chemical solutions and equipment for well maintenance operation must be employed as per the directions on SDS forms and operators' manuals and guidelines. All equipment must meet the standards defined in the Site Safety and Health Plan.

1.6.6 Prevention of Cross Contamination

Take care to decontaminate all equipment between maintenance operations of individual wells. Include the cleaning all of the visible surfaces (and tools that have been used) with a bactericidal solution using the manufacturer's recommended conditions. In addition all lines must be drained or where this is not practicable, the lines shall be replaced.

1.7 DELIVERY, STORAGE, AND HANDLING

Follow the manufacturers recommended guidelines for Transportation and Storage. The Contractor shall take particular care to ensure that potentially antagonistic chemicals are not stored in close proximity.

1.8 REGULATIONS AND CODES

Comply with all the laws, ordinances, codes, rules, and regulations of the Federal, State, and local authorities having jurisdiction over any of the work specified herein.

PART 2 PRODUCTS

2.1 MATERIALS AND EQUIPMENT - GENERAL

Furnish all materials and equipment required for well maintenance operation.

PART 3 EXECUTION

The Contractor is responsible for securing all their materials and equipment while at the site. The Government is not responsible for any of the Contractor's material or equipment vandalized, stolen or otherwise rendered unsuitable for use on this project.

Protect all existing utility and private property items from damage due to

well maintenance operation. If damage to public utility or private property occurs, the Contractor must report to the Contracting Officer's field representative immediately. The Contractor must bear the cost of damage and repairing the damaged item to pre-damaged conditions in a timely manner to the satisfaction of the property owner and the Contracting Officer.

Provide sufficient number of qualified field personnel to implement the well maintenance program. The well maintenance operation must be conducted within normal business hours, which is defined as 7 am to 7 pm. The Contractor must not perform well maintenance outside the normal business hours without the Contracting Officer's approval.

Evaluate the well conditions during the monitoring events and determine if well maintenance is necessary prior to sampling each monitoring well during the event. If a well is determined to require redevelopment, the Contractor must redevelop the well within the timeframe of the monitoring event in order to collect a sample following redevelopment during the sampling event.

Perform all well maintenance and rehabilitation in accordance with **ASTM D5978-96**.

Well maintenance operation can involve combinations of physical and/or chemical applications. The maintenance strategies may change over time, as the goal is to remove and control fouling dynamic conditions. The Contractor must select treatment options suitable for site conditions. Each well has some unique characteristics because of location, variations in construction, distribution of contaminants and the nature of the biological activity within that particular area. Given that each well does possess at least some unique properties, each well must be considered independently and the most effective management practices must be determined on a case-by-case basis. Typically, no one chemical type will address all encrustation and biofouling removal, suspension, dispersal, and repression needs. Blending approaches can permit more effective removal of multiple problems, or treat a single difficult problem more effectively. The exact blend of chemicals for a particular field situation in combination with physical application must be determined by the Contractor and approved by the Contracting Officer prior to its use.

Handle all chemicals in accordance with the SDS. Phosphoric acid and phosphorus-based compounds must NOT be used as a part of well maintenance operations. Phosphoric acid can leave significant amounts of phosphate residues behind which may stimulate the occurrence of biofouling.

Properly contain treatment byproduct and water generated during well maintenance operation for offsite disposal. The offsite disposal must be done in accordance with **SECTION 02 81 00 - TRANSPORTATION AND DISPOSAL WASTE OF MATERIAL**.

3.1 WELL TREATMENT APPLICATIONS

The following paragraphs identify various physical and chemical treatment applications widely used for well maintenance operations.

3.1.1 Physical Application

Employ mechanical methods (e.g., surging with overpumping and/or jetting) to remove the disrupted biomass from the wells both during and after

treatment.

3.1.1.1 Surging with Over-pumping

Perform surging by using surge blocks or by injecting air in the casing above the well screen. Manual brushing can also be used in dislodging material from the well screen and casing. Perform over-pumping either by bailing or pumping to allow water from the aquifer to flow into the well, removing any fines or biofilm fragments that were dislodged through surging or brushing.

3.1.1.2 Jetting

Jetting must be carried out using a perforated jetting tool and a high-pressure water source, coupled with an airlift pump to promptly remove the debris.

3.1.1.3 Aqua Freed®

Use the commercially available Aqua Freed® process or equivalent as directed by the manufacturer. The Aqua Freed process has been employed in wells having a wide variety of construction, flow and fouling characteristics. This process is effective in rehabilitating wells experiencing lost capacity caused by mineral incrustation (i.e., iron, manganese and calcium) as well as biological fouling (e.g., iron-related bacteria, sulfate-reducing bacteria and slime-forming bacteria).

The following steps and procedure are described by Aqua Freed® process developers:

- a. Aqua Freed® process incorporates the controlled application of gaseous and liquid carbon dioxide (CO₂). This process acts on the formation and encrustants in the wells through gas expansion and freezing and thawing, which dislodges deposits, and also through the formation of carbonic acid, acting under pressure. The carbonic acid solution is relatively high in concentration and, as a mild acid, can attack deposits. The thermal shock on bacteria and their biofilm networks also dislodges biofouling.
- b. Aqua Freed® process (often called "freezing") employs the application of cold liquid and gaseous CO₂ for biofouling and encrustation removal. A typical Aqua Freed® process is as follows:
 - (1) Install a packer to confine a desired interval in the well. Begin injection of CO₂ vapor at predetermined and controlled pressures.
 - (2) Begin controlled injection of liquefied CO₂ in pulses.
 - (3) Inject liquefied CO₂ at temperatures and pressures that will encourage the liquid to change to CO₂ "snow", freezing water in the formation around the well.
 - (4) Remove packer and thaw.
 - (5) Employ other mechanical methods to remove debris and disrupted biomass from the wells.

3.1.2 Chemical Application

The Contractor may employ chemical treatment only after mechanical methods have been exhausted to remove the disrupted biomass from the wells both during and after treatment. However, use of chemicals requires approval by the Contracting Officer.

3.1.2.1 Glycolic Acid

Glycolic acid is a chelating agent that binds with divalent cations in the biofilm matrix, thereby reducing its mechanical strength and facilitating biofilm detachment at lower shear stresses. It is also attractive in groundwater environments in that it is relatively biodegradable.

3.1.2.2 Disinfection Products

Chlorine dioxide (ClO_2) and sodium hypochlorite have been used at enhanced in situ bioremediation sites to rehabilitate wells. However, they are strong oxidants and require prior experience in applying them. If these chemicals are proposed for well maintenance, the Contractor must provide their past experience and detailed plans for the Contracting Officer's approval.

-- End of Section --

Table 01 80 00-3**Wells for Synoptic Water Level Measurements****White Chemical Corporation Superfund Site, OU3 RD****Newark, New Jersey**

Well ID	Depth (feet bgs)	Screened Interval (feet bgs)	Top of Inner Casing Elevation (feet amsl)
MW-104I	12	12-22	TBD
MW-104D	33	23-33	TBD
MW-105I	28	18-28	TBD
MW-105D	40	30-40	TBD
MW-106I	28	18-28	TBD
MW-106D	40	30-40	TBD
MW-107I	21	11-21	TBD
MW-107D	33	23-33	TBD
MW-108I	25	15-25	TBD
MW-108D	35	25-35	TBD
MW-109I	30	20-30	TBD
MW-109D	43	33-43	TBD
MW-110I	30	20-30	TBD
MW-110D	43	33-43	TBD
MW-111I	30	20-30	TBD
MW-111D	43	33-43	TBD
MW-109B1	62	52-62	TBD
MW-109B2	100	90-100	TBD
MW-110B1	62	52-62	TBD
MW-110B2	100	90-100	TBD
MW-201D	33	23-33	TBD
MW-202D	34	24-34	TBD
MW-203D	37	27-37	TBD
MW-204D	35	25-35	TBD

Notes:

amsl - above mean sea level

bgs - below ground surface

btic - below top of inner casing

ID - Identification

TBD - to be determined

Measurements are provided based on site conditions in 2016. Information has not been updated for the change in site conditions since then.

This table is to be updated during the RA following completion of well assessment, repairs, and construction.

SECTION 01 85 10

WELL MAINTENANCE PROGRAM

PART 1 GENERAL

1.1 SCOPE OF WORK

Implement a Well Maintenance Program for all monitoring wells.

Furnish all required labor, chemicals, equipment and incidentals, whether specified herein or not, to successfully implement the well maintenance program. Have a thorough understanding of the regulations and the environmental implications associated with the well maintenance program and associated treatment practices.

The well maintenance program must address any deterioration of the wells observed during monitoring well sampling. The program must emphasize rehabilitating and restoring monitoring wells to an acceptable performance for performance monitoring sampling.

Reasons for reduced performance can include biofouling and mineralogical incrustation caused by the groundwater chemistry change due to the injection of amendment near the monitoring wells.

Record water level drawdown measurements for each monitoring well during the baseline and performance monitoring sampling events. During the initial baseline event, determine the optimal purge rate for each well according to low-flow sampling procedures (i.e., the rate at which the drawdown does not exceed 0.3 feet, with a maximum flow rate of 500 milliliters per minute). During subsequent performance monitoring events, measure the drawdown and record the pre-determined optimal purge rate. During subsequent performance monitoring events, if the well drawdown exceeds the requirements for low-flow sampling (drawdown less than 0.3 feet, with a maximum flow rate of 500 milliliters per minute), redevelop and bail all accumulated sediment from the well.

Record the depth to the bottom of the monitoring wells during each monitoring event to document sedimentation that may occur on the bottom of the well. If the depth to the bottom increases by one foot, redevelop the well.

The Contractor must provide its own electrical power and necessary potable water for any well maintenance operations.

The Contractor is responsible for protection and security of their equipment on site.

Well construction details and requirements are presented in the Contract Drawings and SECTION 33 51 39 - MONITORING WELLS.

Requirements for offsite transportation and disposal of investigation derived waste are presented in SECTION 02 81 00 - TRANSPORTATION AND DISPOSAL OF WASTE MATERIAL.

Perform the well maintenance operation in accordance with requirements in SECTION 01 35 29 - HEALTH, SAFETY AND EMERGENCY RESPONSE PROCEDURES.

1.2 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only. Where reference is made to one of these standards, the revision in effect at the time of contract award applies.

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ASTM D5978-96

Maintenance and Rehabilitation of
Groundwater Monitoring Wells

1.3 SUBMITTALS

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SD-01 Preconstruction Submittals

Well Maintenance Work Plan; G

Within 30 days after completion of the well condition assessment, submit the well maintenance work plan for review. Propose methods to be used in monitoring and maintaining the monitoring wells. Mechanical surging and pumping and high pressure jetting techniques are acceptable methods for redeveloping the wells. Chemical treatment, while also acceptable, will require approval by the Contracting officer and must only be used after mechanical methods have failed to redevelop the well.

For chemical treatments, the Contractor must consider the recommendations provided by the Environmental Security and Technology Certification Program (ESTCP) Project ER-0429, 2005 in developing the well maintenance program. Any chemical added to maintain the well must not adversely impact the anaerobic biodegradation of site contaminants generated by the lactate and bicarbonate. A few chemicals were identified as promising biofouling controls for groundwater applications, including chlorine dioxide, NaOCl, glycolic acid, and the addition of carbon dioxide (Aqua Freed®). Other well maintenance measures may also be proposed. The well maintenance program must be approved by the Contracting Officer prior to its use for well maintenance.

SD-03 Product Data

Chemical Data Sheet; G

Submit the specification of chemicals to be used to maintain the monitoring wells.

SD-05 Design Data

Well Maintenance Record/Log; G

Submit the well maintenance record/logs at the completion of each well maintenance event. Records/logs need to include all aspects

of the rehabilitation process from the determination that the well was deteriorating through confirmation, selection and application of the treatment to post-treatment confirmation of the effectiveness of the treatment.

These records/logs must include details of the precise nature of the rehabilitation treatment employed including the type and amount of chemicals used, the sequences in which they were applied, any use of heat or pressures as a part of the treatment and the surging method(s) selected. All of these must be set out chronologically in sequence and confirmed in writing. Well maintenance record/logs must also include any measurements taken in relation to the maintenance of the specific well.

1.4 QUALITY ASSURANCE

Provide standard equipment modified as required and manufactured by companies whose products have commercially available replacement parts and have had similar units in service for not less than 5 years.

1.5 PERMITS

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1.6 TOOLS, SPARE PARTS AND SUPPLIES

Keep sufficient tools, spare parts and supplies necessary for well maintenance. Down time due to equipment failure should be avoided and the Contractor must bear the costs associated with downtime due to equipment failure. All tools used in the well maintenance operation must be suitable to the needs of the treatment. They must be corrosion resistant and kept clean and free from unnecessary grime, grease, and evidence of corrosion.

1.6.1 Pumping Equipment

Chemical treatments may involve aggressive chemistry, possibly along with heat, thus the pumps need to be resistant to corrosion and made of durable materials (e.g., high-grade stainless steel and/or heat and chemical resistant plastics). All connectors for electrical supplies as well as those supplying chemical solutions shall be robust and durable under the extreme conditions expected to occur during the well maintenance operation.

1.6.2 Spare Parts

Keep spare parts on-hand at all times during the treatment process to ensure minimal delays in the event of process failure. Spare parts must include all items that are likely to fail in less than 500 hours of operation and items known to be in the latter third of their active working life. These spare parts must include all relevant valves, pumps, electrical relays, monitoring equipment (including pH, ORP and temperature probes), pipes, and fittings.

1.6.3 Chemical Mixing and Injecting Equipment

All equipment for mixing and the injection of chemicals must be in good operating conditions with a minimal risk of failure due to carelessness,

inadequate specifications, improper maintenance and inappropriate use. The selection of this equipment shall meet the needs and expectation of all entities involved in the well maintenance program.

1.6.4 Chemical Supplies

Obtain chemical supplies from reputable suppliers who can provide the appropriate safety data sheet (SDS) forms for the chemicals. Transportation and storage must follow the recommended guidelines and particular care should be taken to ensure that potentially antagonistic chemicals are not stored in close proximity. Take care to ensure that all of the chemicals used in a treatment must be within their expiration date. It is recommended that 15% more chemicals than directly required for a treatment be kept on-hand to ensure that an effective treatment can be achieved in the event of leakage or spillage.

1.6.5 Safety Equipment

All relevant safety equipment to handle the various chemical solutions and equipment for well maintenance operation must be employed as per the directions on SDS forms and operators' manuals and guidelines. All equipment must meet the standards defined in the Site Safety and Health Plan.

1.6.6 Prevention of Cross Contamination

Take care to decontaminate all equipment between maintenance operations of individual wells. Include the cleaning all of the visible surfaces (and tools that have been used) with a bactericidal solution using the manufacturer's recommended conditions. In addition all lines must be drained or where this is not practicable, the lines shall be replaced.

1.7 DELIVERY, STORAGE, AND HANDLING

Follow the manufacturers recommended guidelines for Transportation and Storage. The Contractor shall take particular care to ensure that potentially antagonistic chemicals are not stored in close proximity.

1.8 REGULATIONS AND CODES

Comply with all the laws, ordinances, codes, rules, and regulations of the Federal, State, and local authorities having jurisdiction over any of the work specified herein.

PART 2 PRODUCTS

2.1 MATERIALS AND EQUIPMENT - GENERAL

Furnish all materials and equipment required for well maintenance operation.

PART 3 EXECUTION

The Contractor is responsible for securing all their materials and equipment while at the site. The Government is not responsible for any of the Contractor's material or equipment vandalized, stolen or otherwise rendered unsuitable for use on this project.

Protect all existing utility and private property items from damage due to

well maintenance operation. If damage to public utility or private property occurs, the Contractor must report to the Contracting Officer's field representative immediately. The Contractor must bear the cost of damage and repairing the damaged item to pre-damaged conditions in a timely manner to the satisfaction of the property owner and the Contracting Officer.

Provide sufficient number of qualified field personnel to implement the well maintenance program. The well maintenance operation must be conducted within normal business hours, which is defined as 7 am to 7 pm. The Contractor must not perform well maintenance outside the normal business hours without the Contracting Officer's approval.

Evaluate the well conditions during the monitoring events and determine if well maintenance is necessary prior to sampling each monitoring well during the event. If a well is determined to require redevelopment, the Contractor must redevelop the well within the timeframe of the monitoring event in order to collect a sample following redevelopment during the sampling event.

Perform all well maintenance and rehabilitation in accordance with **ASTM D5978-96**.

Well maintenance operation can involve combinations of physical and/or chemical applications. The maintenance strategies may change over time, as the goal is to remove and control fouling dynamic conditions. The Contractor must select treatment options suitable for site conditions. Each well has some unique characteristics because of location, variations in construction, distribution of contaminants and the nature of the biological activity within that particular area. Given that each well does possess at least some unique properties, each well must be considered independently and the most effective management practices must be determined on a case-by-case basis. Typically, no one chemical type will address all encrustation and biofouling removal, suspension, dispersal, and repression needs. Blending approaches can permit more effective removal of multiple problems, or treat a single difficult problem more effectively. The exact blend of chemicals for a particular field situation in combination with physical application must be determined by the Contractor and approved by the Contracting Officer prior to its use.

Handle all chemicals in accordance with the SDS. Phosphoric acid and phosphorus-based compounds must NOT be used as a part of well maintenance operations. Phosphoric acid can leave significant amounts of phosphate residues behind which may stimulate the occurrence of biofouling.

Properly contain treatment byproduct and water generated during well maintenance operation for offsite disposal. The offsite disposal must be done in accordance with **SECTION 02 81 00 - TRANSPORTATION AND DISPOSAL WASTE OF MATERIAL**.

3.1 WELL TREATMENT APPLICATIONS

The following paragraphs identify various physical and chemical treatment applications widely used for well maintenance operations.

3.1.1 Physical Application

Employ mechanical methods (e.g., surging with overpumping and/or jetting) to remove the disrupted biomass from the wells both during and after

treatment.

3.1.1.1 Surging with Over-pumping

Perform surging by using surge blocks or by injecting air in the casing above the well screen. Manual brushing can also be used in dislodging material from the well screen and casing. Perform over-pumping either by bailing or pumping to allow water from the aquifer to flow into the well, removing any fines or biofilm fragments that were dislodged through surging or brushing.

3.1.1.2 Jetting

Jetting must be carried out using a perforated jetting tool and a high-pressure water source, coupled with an airlift pump to promptly remove the debris.

3.1.1.3 Aqua Freed®

Use the commercially available Aqua Freed® process or equivalent as directed by the manufacturer. The Aqua Freed process has been employed in wells having a wide variety of construction, flow and fouling characteristics. This process is effective in rehabilitating wells experiencing lost capacity caused by mineral incrustation (i.e., iron, manganese and calcium) as well as biological fouling (e.g., iron-related bacteria, sulfate-reducing bacteria and slime-forming bacteria).

The following steps and procedure are described by Aqua Freed® process developers:

- a. Aqua Freed® process incorporates the controlled application of gaseous and liquid carbon dioxide (CO₂). This process acts on the formation and encrustants in the wells through gas expansion and freezing and thawing, which dislodges deposits, and also through the formation of carbonic acid, acting under pressure. The carbonic acid solution is relatively high in concentration and, as a mild acid, can attack deposits. The thermal shock on bacteria and their biofilm networks also dislodges biofouling.
- b. Aqua Freed® process (often called "freezing") employs the application of cold liquid and gaseous CO₂ for biofouling and encrustation removal. A typical Aqua Freed® process is as follows:
 - (1) Install a packer to confine a desired interval in the well. Begin injection of CO₂ vapor at predetermined and controlled pressures.
 - (2) Begin controlled injection of liquefied CO₂ in pulses.
 - (3) Inject liquefied CO₂ at temperatures and pressures that will encourage the liquid to change to CO₂ "snow", freezing water in the formation around the well.
 - (4) Remove packer and thaw.
 - (5) Employ other mechanical methods to remove debris and disrupted biomass from the wells.

3.1.2 Chemical Application

The Contractor may employ chemical treatment only after mechanical methods have been exhausted to remove the disrupted biomass from the wells both during and after treatment. However, use of chemicals requires approval by the Contracting Officer.

3.1.2.1 Glycolic Acid

Glycolic acid is a chelating agent that binds with divalent cations in the biofilm matrix, thereby reducing its mechanical strength and facilitating biofilm detachment at lower shear stresses. It is also attractive in groundwater environments in that it is relatively biodegradable.

3.1.2.2 Disinfection Products

Chlorine dioxide (ClO_2) and sodium hypochlorite have been used at enhanced in situ bioremediation sites to rehabilitate wells. However, they are strong oxidants and require prior experience in applying them. If these chemicals are proposed for well maintenance, the Contractor must provide their past experience and detailed plans for the Contracting Officer's approval.

-- End of Section --

SECTION 01 85 10

WELL MAINTENANCE PROGRAM

PART 1 GENERAL

1.1 SCOPE OF WORK

Implement a Well Maintenance Program for all monitoring wells.

Furnish all required labor, chemicals, equipment and incidentals, whether specified herein or not, to successfully implement the well maintenance program. Have a thorough understanding of the regulations and the environmental implications associated with the well maintenance program and associated treatment practices.

The well maintenance program must address any deterioration of the wells observed during monitoring well sampling. The program must emphasize rehabilitating and restoring monitoring wells to an acceptable performance for performance monitoring sampling.

Reasons for reduced performance can include biofouling and mineralogical incrustation caused by the groundwater chemistry change due to the injection of amendment near the monitoring wells.

Record water level drawdown measurements for each monitoring well during the baseline and performance monitoring sampling events. During the initial baseline event, determine the optimal purge rate for each well according to low-flow sampling procedures (i.e., the rate at which the drawdown does not exceed 0.3 feet, with a maximum flow rate of 500 milliliters per minute). During subsequent performance monitoring events, measure the drawdown and record the pre-determined optimal purge rate. During subsequent performance monitoring events, if the well drawdown exceeds the requirements for low-flow sampling (drawdown less than 0.3 feet, with a maximum flow rate of 500 milliliters per minute), redevelop and bail all accumulated sediment from the well.

Record the depth to the bottom of the monitoring wells during each monitoring event to document sedimentation that may occur on the bottom of the well. If the depth to the bottom increases by one foot, redevelop the well.

The Contractor must provide its own electrical power and necessary potable water for any well maintenance operations.

The Contractor is responsible for protection and security of their equipment on site.

Well construction details and requirements are presented in the Contract Drawings and SECTION 33 51 39 - MONITORING WELLS.

Requirements for offsite transportation and disposal of investigation derived waste are presented in SECTION 02 81 00 - TRANSPORTATION AND DISPOSAL OF WASTE MATERIAL.

Perform the well maintenance operation in accordance with requirements in SECTION 01 35 29 - HEALTH, SAFETY AND EMERGENCY RESPONSE PROCEDURES.

1.2 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only. Where reference is made to one of these standards, the revision in effect at the time of contract award applies.

ASTM INTERNATIONAL (ASTM)

ASTM D5978-96

Maintenance and Rehabilitation of
Groundwater Monitoring Wells

1.3 SUBMITTALS

Contracting Officer approval is required for submittals with a "G" designation; submittals having an "FIO" designation are for information only. The following must be submitted in accordance with SECTION 01 33 00 - SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Well Maintenance Work Plan; G

Propose methods to be used in monitoring and maintaining the monitoring wells. Mechanical surging and pumping and high pressure jetting techniques are acceptable methods for redeveloping the wells. Chemical treatment, while also acceptable, will require approval by the Contracting officer and must only be used after mechanical methods have failed to redevelop the well.

For chemical treatments, the Contractor must consider the recommendations provided by the Environmental Security and Technology Certification Program (ESTCP) Project ER-0429, 2005 in developing the well maintenance program. Any chemical added to maintain the well must not adversely impact the anaerobic biodegradation of site contaminants generated by the lactate and bicarbonate. A few chemicals were identified as promising biofouling controls for groundwater applications, including chlorine dioxide, NaOCl, glycolic acid, and the addition of carbon dioxide (Aqua Freed®). Other well maintenance measure may also be proposed. The well maintenance program must be approved by the Contracting Officer prior to its use for well maintenance.

SD-03 Product Data

Chemical Data Sheet; G

Submit the specification of chemicals to be used to maintain the monitoring wells.

SD-05 Design Data

Well Maintenance Record/Log; G

Submit the well maintenance record/logs at the completion of each well maintenance event. Records/logs need to include all aspects of the rehabilitation process from the determination that the well was deteriorating through confirmation, selection and application

of the treatment to post-treatment confirmation of the effectiveness of the treatment.

These records/logs must include details of the precise nature of the rehabilitation treatment employed including the type and amount of chemicals used, the sequences in which they were applied, any use of heat or pressures as a part of the treatment and the surging method(s) selected. All of these must be set out chronologically in sequence and confirmed in writing. Well maintenance record/logs must also include any measurements taken in relation to the maintenance of the specific well.

1.4 QUALITY ASSURANCE

Provide standard equipment modified as required and manufactured by companies whose products have commercially available replacement parts and have had similar units in service for not less than 5 years.

1.5 PERMITS

The Contractor is responsible for obtaining all necessary permits for the well maintenance in accordance with Federal, State and local regulatory requirements, including the NJDEP Permit Equivalent for Remediation Discharges to Groundwater.

1.6 TOOLS, SPARE PARTS AND SUPPLIES

Keep sufficient tools, spare parts and supplies necessary for well maintenance. Down time due to equipment failure should be avoided and the Contractor must bear the costs associated with downtime due to equipment failure. All tools used in the well maintenance operation must be suitable to the needs of the treatment. They must be corrosion resistant and kept clean and free from unnecessary grime, grease, and evidence of corrosion.

1.6.1 Pumping Equipment

Chemical treatments may involve aggressive chemistry, possibly along with heat, thus the pumps need to be resistant to corrosion and made of durable materials (e.g., high-grade stainless steel and/or heat and chemical resistant plastics). All connectors for electrical supplies as well as those supplying chemical solutions shall be robust and durable under the extreme conditions expected to occur during the well maintenance operation.

1.6.2 Spare Parts

Keep spare parts on-hand at all times during the treatment process to ensure minimal delays in the event of process failure. Spare parts must include all items that are likely to fail in less than 500 hours of operation and items known to be in the latter third of their active working life. These spare parts must include all relevant valves, pumps, electrical relays, monitoring equipment (including pH, ORP and temperature probes), pipes, and fittings.

1.6.3 Chemical Mixing and Injecting Equipment

All equipment for mixing and the injection of chemicals must be in good operating conditions with a minimal risk of failure due to carelessness, inadequate specifications, improper maintenance and inappropriate use. The selection of this equipment shall meet the needs and expectation of all

entities involved in the well maintenance program.

1.6.4 Chemical Supplies

Obtain chemical supplies from reputable suppliers who can provide the appropriate safety data sheet (SDS) forms for the chemicals. Transportation and storage must follow the recommended guidelines and particular care should be taken to ensure that potentially antagonistic chemicals are not stored in close proximity. Take care to ensure that all of the chemicals used in a treatment must be within their expiration date. It is recommended that 15% more chemicals than directly required for a treatment be kept on-hand to ensure that an effective treatment can be achieved in the event of leakage or spillage.

1.6.5 Safety Equipment

All relevant safety equipment to handle the various chemical solutions and equipment for well maintenance operation must be employed as per the directions on SDS forms and operators' manuals and guidelines. All equipment must meet the standards defined in the Site Safety and Health Plan.

1.6.6 Prevention of Cross Contamination

Take care to decontaminate all equipment between maintenance operations of individual wells. Include the cleaning all of the visible surfaces (and tools that have been used) with a bactericidal solution using the manufacturer's recommended conditions. In addition all lines must be drained or where this is not practicable, the lines shall be replaced.

1.7 DELIVERY, STORAGE, AND HANDLING

Follow the manufacturers recommended guidelines for Transportation and Storage. The Contractor shall take particular care to ensure that potentially antagonistic chemicals are not stored in close proximity.

1.8 REGULATIONS AND CODES

Comply with all the laws, ordinances, codes, rules, and regulations of the Federal, State, and local authorities having jurisdiction over any of the work specified herein.

PART 2 PRODUCTS

2.1 MATERIALS AND EQUIPMENT - GENERAL

Furnish all materials and equipment required for well maintenance operation.

PART 3 EXECUTION

The Contractor is responsible for securing all their materials and equipment while at the site. The Government is not responsible for any of the Contractor's material or equipment vandalized, stolen or otherwise rendered unsuitable for use on this project.

Protect all existing utility and private property items from damage due to well maintenance operation. If damage to public utility or private property occurs, the Contractor must report to the Contracting Officer's

field representative immediately. The Contractor must bear the cost of damage and repairing the damaged item to pre-damaged conditions in a timely manner to the satisfaction of the property owner and the Contracting Officer.

Provide sufficient number of qualified field personnel to implement the well maintenance program. The well maintenance operation must be conducted within normal business hours, which is defined as 7 am to 7 pm. The Contractor must not perform well maintenance outside the normal business hours without the Contracting Officer's approval.

Evaluate the well conditions during the monitoring events and determine if well maintenance is necessary prior to sampling each monitoring well during the event. If a well is determined to require redevelopment, the Contractor must redevelop the well within the timeframe of the monitoring event in order to collect a sample following redevelopment during the sampling event.

Perform all well maintenance and rehabilitation in accordance with **ASTM D5978-96**.

Well maintenance operation can involve combinations of physical and/or chemical applications. The maintenance strategies may change over time, as the goal is to remove and control fouling dynamic conditions. The Contractor must select treatment options suitable for site conditions. Each well has some unique characteristics because of location, variations in construction, distribution of contaminants and the nature of the biological activity within that particular area. Given that each well does possess at least some unique properties, each well must be considered independently and the most effective management practices must be determined on a case-by-case basis. Typically, no one chemical type will address all encrustation and biofouling removal, suspension, dispersal, and repression needs. Blending approaches can permit more effective removal of multiple problems, or treat a single difficult problem more effectively. The exact blend of chemicals for a particular field situation in combination with physical application must be determined by the Contractor and approved by the Contracting Officer prior to its use.

Handle all chemicals in accordance with the SDS. Phosphoric acid and phosphorus-based compounds must NOT be used as a part of well maintenance operations. Phosphoric acid can leave significant amounts of phosphate residues behind which may stimulate the occurrence of biofouling.

Properly contain treatment byproduct and water generated during well maintenance operation for offsite disposal. The offsite disposal must be done in accordance with SECTION 02 81 00 - TRANSPORTATION AND DISPOSAL WASTE OF MATERIAL.

3.1 WELL TREATMENT APPLICATIONS

The following paragraphs identify various physical and chemical treatment applications widely used for well maintenance operations.

3.1.1 Physical Application

Employ mechanical methods (e.g., surging with overpumping and/or jetting) to remove the disrupted biomass from the wells both during and after treatment.

3.1.1.1 Surging with Over-pumping

Perform surging by using surge blocks or by injecting air in the casing above the well screen. Manual brushing can also be used in dislodging material from the well screen and casing. Perform over-pumping either by bailing or pumping to allow water from the aquifer to flow into the well, removing any fines or biofilm fragments that were dislodged through surging or brushing.

3.1.1.2 Jetting

Jetting must be carried out using a perforated jetting tool and a high-pressure water source, coupled with an airlift pump to promptly remove the debris.

3.1.1.3 Aqua Freed®

Use the commercially available Aqua Freed® process or equivalent as directed by the manufacturer. The Aqua Freed process has been employed in wells having a wide variety of construction, flow and fouling characteristics. This process is effective in rehabilitating wells experiencing lost capacity caused by mineral incrustation (i.e., iron, manganese and calcium) as well as biological fouling (e.g., iron-related bacteria, sulfate-reducing bacteria and slime-forming bacteria).

The following steps and procedure are described by Aqua Freed® process developers:

- a. Aqua Freed® process incorporates the controlled application of gaseous and liquid carbon dioxide (CO₂). This process acts on the formation and encrustants in the wells through gas expansion and freezing and thawing, which dislodges deposits, and also through the formation of carbonic acid, acting under pressure. The carbonic acid solution is relatively high in concentration and, as a mild acid, can attack deposits. The thermal shock on bacteria and their biofilm networks also dislodges biofouling.
- b. Aqua Freed® process (often called "freezing") employs the application of cold liquid and gaseous CO₂ for biofouling and encrustation removal. A typical Aqua Freed® process is as follows:
 - (1) Install a packer to confine a desired interval in the well. Begin injection of CO₂ vapor at predetermined and controlled pressures.
 - (2) Begin controlled injection of liquefied CO₂ in pulses.
 - (3) Inject liquefied CO₂ at temperatures and pressures that will encourage the liquid to change to CO₂ "snow", freezing water in the formation around the well.
 - (4) Remove packer and thaw.
 - (5) Employ other mechanical methods to remove debris and disrupted biomass from the wells.

3.1.2 Chemical Application

The Contractor may employ chemical treatment only after mechanical methods have been exhausted to remove the disrupted biomass from the wells both

during and after treatment. However, use of chemicals requires approval by the Contracting Officer.

3.1.2.1 Glycolic Acid

Glycolic acid is a chelating agent that binds with divalent cations in the biofilm matrix, thereby reducing its mechanical strength and facilitating biofilm detachment at lower shear stresses. It is also attractive in groundwater environments in that it is relatively biodegradable.

3.1.2.2 Disinfection Products

Chlorine dioxide (ClO_2) and sodium hypochlorite have been used at enhanced in situ bioremediation sites to rehabilitate wells. However, they are strong oxidants and require prior experience in applying them. If these chemicals are proposed for well maintenance, the Contractor must provide their past experience and detailed plans for the Contracting Officer's approval.

-- End of Section --

SECTION 02 10 00

SITE PREPARATION

PART 1 GENERAL

1.1 SCOPE OF WORK

Furnish all labor, materials, and equipment required to perform all site preparation activities on the White Chemical Corporation (WCC) property and on the 646 Frelinghuysen Avenue property as follows:

- a. Construct staging area on WCC property
- b. Mobilize and construct temporary site facilities on WCC property
- c. Place dense graded aggregate on the driveway entering the WCC property
- d. Complete any necessary clearing at both properties
- e. Remove debris from both properties and properly dispose of offsite
- f. Complete a utility survey at both properties
- g. Complete a topographic survey at both properties as specified in SECTION 01 71 23 - SURVEYING.
- h. Complete a monitoring well condition assessment as specified in SECTION 33 51 39 - MONITORING WELLS.

Obtain all required permits for site preparation activities prior to start of the work in accordance with SECTION 01 11 00 - SUMMARY OF WORK. Coordinate all local permit requirements in advance with the Government.

Field verify the existing conditions at the site prior to commencing the work, in accordance the SECTION 01 71 23 - SURVEYING. Prior to performing site preparation activities, document existing site conditions via photographs and video, in accordance with SECTION 01 30 00 - ADMINISTRATIVE REQUIREMENTS and SECTION 01 32 36 - VIDEO MONITORING AND DOCUMENTATION, and report in writing to the Contracting Officer prior to the commencement of any site preparation work. Discuss any significant difference between the assumed existing conditions and actual conditions at the time of construction with the Contracting Officer prior to the work.

This section is written as a Performance Specification. It is not the intent of this section to specify all details of site preparation. It is the Contractor's responsibility to provide a staging area and maintain the access road to the site. Furnish all required equipment and incidentals, whether specified herein or not, to produce a fully maintained and operational access road and staging area.

1.2 REFERENCES

ASTM INTERNATIONAL (ASTM)

ASTM D6913/D6913M

Standard Test Methods for Particle-Size
Distribution (Gradation) of Soils Using

Sieve Analysis

ASTM D7928

Standard Test Method for Particle-Size
Distribution (Gradation) of Fine-Grained
Soils Using the Sedimentation (Hydrometer)
Analysis

NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION (NJDEP)

Fill Material Guidance

Fill Material Guidance for SRP Sites

ENGINEERING MANUALS (EM)

EM 385-1-1

Safety and Health Requirements Manual

AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS
(AASHTO)

AASHTO M 147

Standard Specification for Materials for
Aggregate and Soil-Aggregate Subbase,
Base, and Surface Courses

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals with an "FIO" designation are for information only. Submit the following to the Contracting Officer in accordance with SECTION 01 33 00 - SUBMITTAL PROCEDURES.

SD-01 Preconstruction Submittals

Site Preparation Plan; G

Submit the Site Preparation Plan at least 21 calendar days prior to Pre-Construction conference. The Site Preparation Plan must address in detail all the work listed under PART 3 of this specification section. In addition, it must include a drawing showing the temporary site facility layout, the proposed staging areas for temporary facilities and other equipment, construction access points and driveway, areas of planned clearing, temporary fencing, monitoring wells to be inspected, installed, and protected, decontamination zone, and work areas.

Utility Survey; G

Submit the utility survey prior to commencement of any subsurface activities, in accordance with Paragraph 3.5.

SD-04 Samples

Proposed Aggregate Samples; G

Submit samples of aggregate described in Paragraph 2.1 weighing approximately 50 pounds in accordance with Paragraph 1.4.2. Do not use the material as part of the contract work until receiving written authorization from the Government.

SD-06 Test Reports

Laboratory Results; G

Submit the results of all laboratory and field testing, as specified in Paragraph 1.5 within 24 hours of receipt. These must include the results of all sieve analysis performed of fill materials.

SD-07 Certificates

Permits; FIO

Copies of all permits not submitted under another section, if applicable.

Aggregate sources and certification; G

Submit the proposed source for fill materials discussed in Section 2.1. Include certifications of compliance attesting that the materials meet the specified requirements for particle size, textural class, and chemical analyses.

1.4 CERTIFICATION AND CONFORMANCE TESTING OF MATERIALS

Perform physical and analytical conformance testing on fill materials prior to their use on the project as follows. Submit all test results to the Contracting Officer in accordance with SECTION 01 35 45 - CHEMICAL DATA QUALITY CONTROL. Provide test results and determinations of suitability to the Contracting Officer no later than 3 days prior to the placement of fill materials.

Testing must be performed by an approved commercial testing laboratory or may be performed by the Contractor subject to approval by the Contracting Officer. Submit to the Contracting Officer for approval licenses or certifications of qualification for the performance of laboratory testing.

1.4.1 Chemical Testing

Test all imported fill materials to ensure they are free from chemical and radiological contamination, meeting the clean fill criteria as defined in SECTION 01 35 45 - CHEMICAL DATA QUALITY CONTROL. Results must be certified in writing. The Government will accompany the Contractor to visit all borrow sources.

Minimal chemical testing sampling frequency must be as indicated in Table 2 of the [Fill Material Guidance](#) and no less than one test per borrow area.

1.4.2 Physical Testing Chemical Testing

At least 7 days prior to the import of any fill materials to the site, deliver a representative sample of the proposed materials weighing at least 50 lbs to the soils testing laboratory in accordance with SECTION 01 33 00 - SUBMITTAL PROCEDURES.

Perform the following tests on materials described in Paragraph 2.1. Minimal physical testing sampling frequency must be one sample per 5,000 CY of material, no less than one test per borrow area, or as requested by the Government.

Grain size analyses ([ASTM D6913/D6913M](#) and [ASTM D7928](#)) of the samples must be performed to determine their suitability for use as fill material in conformance to the materials requirements specified herein.

1.5 CONFORMANCE TESTING

The Contractor is responsible for conformance testing. Testing must be performed by an approved commercial testing laboratory or may be performed by the Contractor subject to approval by the Contracting Officer. The Contractor must submit to the Contracting Officer for approval licenses or certifications of qualification for the performance of field and laboratory testing.

The Contractor's Quality Control Laboratory must conduct initial conformance tests to show that the materials in Paragraph 2.1 meet the specification requirements and to identify the compaction properties of the soils. At a minimum, the tests listed below must be conducted for each material and submitted as initial conformance test results. In addition, periodic conformance testing must be conducted by the Contractor's Quality Control Laboratory on common fill soils prior to their use on the project. Unless otherwise specified, the requirements outlined in Table 02 61 14-1 apply.

Submit results of the tests to the Contracting Officer within 24 hours of test completion and prior to material use on the project. The Government reserves the right to reject material based on the results of these conformance tests and/or independent quality assurance testing conducted by the Government. Rejected materials must be removed from the site.

PART 2 PRODUCTS

2.1 DENSE GRADED AGGREGATE

Dense-graded aggregate must be sound, hard, durable particles or fragments of stone, gravel or slag retained on the No. 10 sieve and must conform to [AASHTO M 147](#).

Dense-graded aggregate must be suitable excavated materials, natural or processed mineral soils obtained from off site sources, or graded crushed stone or gravel. It must be free of all organic material, trash, snow, ice, frozen soil, or other objectionable materials which may be compressible or which cannot be properly compacted. All imported fill materials must come from virgin sources. Recycled materials are not acceptable. Dredged material must not be used.

Perform certification of all materials and quality assurance as indicated in Paragraph 1.4 and 1.5.

2.2 FENCING

Provide highly visible fencing along active work areas to control access by unauthorized personnel. All fencing must meet the requirements of [EM 385-1-1](#). Remove the fence upon completion and acceptance of the work.

2.2.1 Polyethylene Mesh Safety Fencing

Temporary safety fencing must be a high visibility orange colored, high density polyethylene grid, a minimum of 48 inches high and maximum mesh size of 2 inches. Fencing must extend from the grade to a minimum of 48 inches above the grade and be tightly secured to T-posts spaced as necessary to maintain a rigid and taut fence. Fencing must remain rigid and taut with a minimum of 200 pounds of force exerted on it from any

direction with less than 4 inches of deflection.

2.2.2 Chain Link Panel Fencing

Temporary panel fencing must be galvanized steel chain link panels 6 feet high. Multiple fencing panels may be linked together at the bases to form long spans as needed. Weigh down each panel base using sand bags or other suitable materials in order for the fencing to withstand anticipated winds while remaining upright. Fencing must remain rigid and taut with a minimum of 200 pounds of force exerted on it from any direction with less than 4 inches of deflection.

PART 3 EXECUTION

3.1 STAGING AREA

Construct the trailer staging area in accordance with the Contractor's approved Site Preparation Plan.

Since the entire WCC property is contaminated and requires injection, the staging area for IDW, construction trailers, construction equipment, etc., must be relocated if initially set up in an area where groundwater screening and/or injections are required.

Construct a staging area for the lactate and ZVI with organics that require containment. The lactate must be placed in a secondary containment area with a capacity of 110% the largest container size. The pallets of ZVI with organics must be stored in a portable storage unit.

All IDW must be staged in appropriate containers in accordance with SECTION 33 51 39 - MONITORING WELLS.

3.2 TEMPORARY SITE FACILITIES

Construct the temporary facilities including the temporary office trailers, signs, construction fencing and barriers, decontamination facilities, and traffic control devices in accordance with the Contractor's approved Temporary Site Facility Layout Plan and in accordance with SECTION 01 50 00 - TEMPORARY CONSTRUCTION FACILITIES AND UTILITIES.

3.3 UTILITY MARKOUT AND CLEARANCE

Prior to starting site preparation work for the installation of temporary groundwater screening borings and monitoring wells at the site, obtain utility clearance using the New Jersey "One Call" system, to avoid disturbing buried utilities. In addition, the Contractor must consult with the 646 Frelinghuysen Avenue property owner and use ground penetrating radar (GPR) to locate any buried utilities on the property.

The Contractor is responsible for confirming that all mark-outs in the area designated for intrusive activities have been completed and are clearly visible (e.g., neon paint, flags, stakes) and are distinguishable and unambiguous with respect to identifying the utilities. Utility clearance records must be submitted to the Contracting Officer prior to drilling. Utility clearance must be updated as necessary so that no drilling is performed after the utility clearance has expired.

3.4 CLEARING

Perform clearing as necessary, prior to commencing the other remedial activities. All brush, shrubs, and hedges at the White Chemical Corporation property must be cleared and properly disposed offsite. Consider all vegetation uncontaminated, and dispose of them accordingly in accordance with SECTION 02 81 00 - TRANSPORTATION AND DISPOSAL OF WASTE MATERIAL.

3.5 UTILITY SURVEY

Locate utilities (e.g. water, storm, sewer, gas) within the WCC property and the 646 Frelinghuysen Avenue property within Contract limits shown on the Contract Drawings. Obtain coordinates of utility features (e.g., manholes storm drains, culverts, inverts) and provide invert elevations for sanitary sewer and storm drain utilities, drainage and irrigation channels, electrical vaults, and telephone vaults. Coordinates must include northing, easting, latitude, longitude, and surface elevation measured in feet above mean sea level. Show utility features and locations on a site map.

Use GPR and electromagnetic probes to locate existing underground obstructions at the WCC property and the 646 Frelinghuysen Avenue property. GPR data must be collected in perpendicular grid pattern with 2-foot spacing between individual transects.

3.6 ACCESS ROADS

Place dense-graded aggregate, uniformly graded, on the driveway leading to the WCC property from Frelinghuysen Avenue to the extent shown on the Contract Drawings in order to prevent rainwater from pooling during storm events and allow for efficient access to the Site by heavy equipment.

3.7 REMOVAL OF DEBRIS

Debris may be present on the site at both properties. Remove the debris prior to commencement of the groundwater screening activities, but after placement and grading of additional gravel in the driveway at the WCC property.

3.8 WASTE HANDLING AND DISPOSAL

Load concrete/construction debris into roll-off containers for off-site disposal. Dispose of debris from site preparation operations at an approved off-site disposal facility in accordance with SECTION 02 81 00 - TRANSPORTATION AND DISPOSAL OF WASTE MATERIAL.

No rubbish or debris of any kind can be buried on the project site.

The Contractor is responsible for all wastes until they are accepted by the disposal facility. It is the Contractor's responsibility to ensure that all waste shipments comply with the disposal facility's requirements at the time of receipt of the shipments at the disposal facility.

-- End of Section --

SECTION 02 32 13

SUBSURFACE DRILLING AND SAMPLING

PART 1 GENERAL

1.1 SCOPE OF WORK

Furnish all labor, materials, equipment, and incidentals necessary to complete groundwater screening at locations on the White Chemical Corporation (WCC) property and 646 Frelinghuysen Avenue property as shown on the Contract Drawings.

Install direct push technology (DPT) borings to refusal which should be encountered at the top of the weathered bedrock, approximately up to a depth of 45 feet below ground surface (bgs), and collect groundwater screening samples every five feet from refusal to within 4 feet of the water table using a 4- or 5-foot, 10-slot screen, Geoprobe™ groundwater sampler or equivalent, as shown on the Contract Drawings. Send samples to an off-site laboratory for 72-hour turn-around time (TAT) volatile organic compound (VOC) analysis in accordance with SECTION 01 35 45 - CHEMICAL DATA QUALITY CONTROL.

Supply a minimum of two rigs for groundwater screening to meet the project schedule.

Obtain well permits from the New Jersey Department of Environmental Protection (NJDEP), if necessary.

Contain and dispose of all investigation derived waste (IDW) generated during groundwater screening field activities in accordance with SECTION 02 81 00 - TRANSPORTATION AND DISPOSAL OF WASTE MATERIAL.

This Section is intended to provide a general description of what is required but does not cover all variations that may occur in the field. This Section is intended to cover the successful completion of a groundwater screening program as herein specified, whether every detail is specifically mentioned or not.

1.2 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only. Where reference is made to one of these standards, the revision in effect at the time of contract award applies.

ASTM INTERNATIONAL (ASTM)

ASTM C150/C150M	Standard Specification for Portland Cement
ASTM D5088	Decontamination of Field Equipment Used at Nonradioactive Waste Sites

NEW JERSEY ADMINISTRATIVE CODE (N.J.A.C)

N.J.A.C. 7:9D	Well Construction and Maintenance; Sealing
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of Abandoned Wells

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals with an "FIO" designation are for information only. Submit the following to the Contracting Officer in accordance with SECTION 01 33 00 - SUBMITTAL PROCEDURES.

SD-01 Preconstruction Submittals

Permits; G

If permits are required for groundwater screening borings, obtain such permits and furnish copies of the permits to the Contracting Officer prior to drilling.

SD-06 Test Reports

Preliminary VOC Results; G

Submit preliminary 72-hour TAT VOC results on a daily basis as soon as they become available to assist in the determination of monitoring well screen placement.

Validated VOC Results; G

After completion of the groundwater screening field program, submit the groundwater screening results in accordance with requirements specified in SECTION 01 35 45 - CHEMICAL DATA QUALITY CONTROL. Submit a summary table of the validated VOC results for compounds detected in a Microsoft (MS) Excel spreadsheet.

Boring Coordinates; FIO

After completion of the groundwater screening program, submit the surveyed coordinates of each groundwater screening boring in accordance with SECTION 01 71 23 - SURVEYING.

1.4 QUALIFICATIONS

All drilling must be performed or supervised by a State of New Jersey-licensed well driller. The driller's license must meet licensing requirements of the State of New Jersey. The Contractor must only employ personnel competent to perform the work.

All personnel must have completed OSHA-required 40-hour training for work on hazardous waste sites, 8-hour refresher training as appropriate, and must be participating in OSHA-required medical monitoring program for work on hazardous waste sites.

1.5 REGULATORY REQUIREMENTS

1.5.1 Permits and Licenses

Obtain all local, state, or federal permits or licenses required to perform the work included in this contract prior to commencing drilling operations.

1.5.2 Statutes and Regulations

Work required by this specification must be conducted in strict compliance with applicable local, state, and federal regulations, statutes, and codes. Compliance must be the responsibility of the Contractor.

1.6 HEALTH AND SAFETY

Perform all field activities in accordance with the approved Accident Prevention Plan and SECTION 01 35 29 - HEALTH, SAFETY AND EMERGENCY RESPONSE PROCEDURES.

PART 2 PRODUCTS

2.1 EQUIPMENT AND SUPPLIES

All equipment, materials, and methods to be used must be subject to approval by the Contracting Offer before the work is started. However, approval of the equipment, materials, and methods must not be construed as including approval of the performance thereof. Additional equipment and methods must be provided where ordered by the Contracting Offer, if required, to perform the work satisfactorily according to the specifications.

2.2 DIRECT PUSH TECHNOLOGY DRILL RIG

The acceptable DPT rigs and groundwater screening tool are Geoprobe™ and SP22 4-foot groundwater sampler or equivalent. The DPT rig must be capable of advancing a 2-inch diameter borehole to depths of 55 feet bgs in a silty clay/clayey silt formation. The use of other drilling methods and groundwater screening sample collection tools must be subject to approval by the Contracting Offer.

The drill rigs must be free from leaks of fuel, hydraulic fluid, and oil that may contaminate the borehole, ground surface or drill tools.

2.3 CEMENT/BENTONITE GROUT

The borehole annulus must be sealed the entire length to ground surface. The grout must be mixed to the following proportion (N.J.A.C. 7:9D-2.9):

- a. 8.3 gallons potable water
- b. 94 pounds Type II Portland Cement (ASTM C150/C150M)
- c. 5.0 pounds sodium-based bentonite

2.4 LUBRICANTS

Tool joint lubricants used during drilling operations must contain no petroleum products.

2.5 WATER

The Contractor must be responsible for obtaining the water, transporting it to, and storing it where needed.

All water used in the drilling construction of the wells and decontamination of the drill rods must be potable as described by EPA for

both Primary and Secondary Drinking Water Standards. The Contractor must submit proof of water quality.

2.6 COLLECTION OF GROUNDWATER SCREENING SAMPLES

Equipment for collection of groundwater screening samples include but are not limited to tubing, stop/check valves, and peristaltic pumps.

2.7 MISCELLANEOUS MATERIALS

All miscellaneous materials used must be proposed by the Contractor and approved by the Contracting Officer prior to use.

PART 3 EXECUTION

3.1 MOBILIZATION AND DEMOBILIZATION

3.1.1 Mobilization

Mobilization consists of the delivery to the site of all equipment, materials and supplies to be furnished by the Contractor, the complete assembly in satisfactory working order of all such equipment at the jobsite and the satisfactory storage at the site of all such materials and supplies.

3.1.2 Demobilization

Demobilization consists of the removal from the site of all equipment, materials and supplies after completion of the work and also includes, at the direction of the Contracting Officer, the cleanup and removal of all scrap, waste backfill material, waste drilling fluid, soil contaminated with engine/hydraulic oil, backfilling all sumps or excavations resulting from the operations and, in general, returning the site as close to its original condition as possible.

3.2 SITE CONDITIONS, PROTECTION OF EXISTING FACILITIES, AND ENVIRONMENTAL PROTECTION

Physical access to each drilling location, including any utility clearance, must be the responsibility of the Contractor. The Contractor must visit each proposed boring location to observe any conditions that may hamper transporting equipment or personnel to the site. If clearing or relocation is necessary, the Contractor and the Contracting Officer's field representative must agree on a suitable clearing, or relocation approach.

The Contractor must protect all surface and subsurface structures and surrounding areas from damage that may result from the methods employed in performing the work. The Contractor must be responsible for any damages resulting from his operations. Damage to property must be repaired or replaced to the existing condition, as approved by the Contracting Officer.

The Contractor must take all precautions as may be required to prevent contaminated water or water having undesirable physical or chemical characteristics from spilling on the ground surface. The Contractor also must take all precautions necessary to prevent contamination of the ground surface or surface waters resulting from drilling of the boreholes.

During drilling, precautions must be used to prevent tampering with the borehole or entrance of foreign material. Runoff must be prevented from entering the borehole during construction. If there is an interruption in work, such as overnight shutdown or inclement weather, the borehole opening must be closed with a watertight uncontaminated cover. The cover must be secured in place or weighted down so that it cannot be removed except with the aid of the drilling equipment or through the use of drill tools.

3.3 UTILITY MARKOUT

Utility mark out must be conducted in accordance with SECTION 02 10 00 - SITE PREPARATION.

3.4 DECONTAMINATION

A temporary decontamination pad must be constructed at the site where the drill rig, drill rods, drill bits, tremie pipes, grout pumping lines, and other associated equipment must be cleaned with high-pressure water prior to drilling at each well location. The design of the decontamination pad must be submitted under SECTION 33 51 39 - MONITORING WELLS.

The equipment must also be cleaned after drilling is completed. Decontamination must be conducted in accordance with ASTM D5088. Decontamination must be performed at a central decontamination station. The decontamination wash water must be containerized and disposed of in accordance with SECTION 02 81 00 - TRANSPORTATION AND DISPOSAL OF WASTE MATERIAL.

3.5 DPT DRILLING AND COLLECTION OF GROUNDWATER SCREENING SAMPLES

Groundwater screening samples must be collected every five feet from the depth of refusal to within four feet below the water table. The following process must be utilized by the Contractor to collect the groundwater screening samples.

1. Advance the borehole at the location to the top of weathered bedrock or until refusal is encountered with an expandable point and screen installed in the lead drive rod.
2. After reaching the weathered bedrock or encountering refusal, pull the drive rods up by a length equal to the length of the screen while ensuring the expandable point and the screen are exposed to the formation.
3. Collect a water level reading and then briefly develop the screened interval by purging a minimum of one well volume of water or until relatively silt free purge water is observed. Once this purge is performed, collect a groundwater sample for laboratory analysis.
4. The groundwater samples collected must be analyzed for target analyte list (TAL) VOC analysis on a 72-hour turn-around-time (TAT).
5. Remove the screen and rods from the borehole and decontaminate in accordance with the Contractor's approved UFP-QAPP.
6. Steps 1 through 4 must be repeated with the bottom of the subsequent sampling interval located within 6 inches of the top of previous sampling interval until the shallowest groundwater sample within 4

feet of the water table is collected.

7. Tremie grout the borehole location in accordance with N.J.A.C. 7:9D.
8. If the screening point is located on an asphalt surface, after grouting the screening location with grout, use a temporary asphalt cold patch at the top of the injection location to match the surrounding asphalt surface until the site restoration is completed.

3.6 SEQUENCE OF GROUNDWATER SCREENING LOCATIONS

The groundwater screening samples must be collected from the corners of the WCC property first, moving inward to the center of the property. The groundwater screening samples on the 646 Frelinghuysen Avenue property must be collected from east to west.

After evaluating the distribution of VOCs at the primary groundwater screening locations, the Contracting Officer will determine if additional groundwater screening is necessary. Depending on the distribution of VOCs encountered during groundwater screening, advancement of additional groundwater screening borings may be necessary. The Contractor must advance additional groundwater screening borings as directed by the Contracting Offer.

3.7 RECORDS

Submit complete, legible copies of ENG FORM 1836 and 1836A, and records to the Contracting Officer upon completion of the work or at such other time or times as directed. Keep accurate driller's logs (DRILLING LOG, ENG FORM 1836, and 1836-A will be provided by the Contracting Officer) and records of all work accomplished under this contract and deliver complete, legible copies of these logs and records to the Contracting Officer upon completion of the work or at such other time or times as directed. All such records must be recorded during the actual performance of the work and must be preserved in good condition and order until they are delivered and accepted. The Contracting Officer has the right to examine and review all such records at any time prior to their delivery and has the right to request changes to the record keeping procedure. The following information must be included on the logs or in the records for each hole:

- a. Hole number or designation and elevation of top of hole.
- b. Driller's name.
- c. Type, make, size, and manufacturer's model designation of drilling and sampling equipment.
- d. Hole diameter.
- e. Dates and time by depths when drilling and sampling operations were performed.
- f. Depths at which samples or cores were recovered or attempts made to sample or core including top and bottom depth of each run and the percentage of sample or core recovered per run.
- g. Depth at which groundwater is encountered initially and when stabilized.

White Chemical Corporation Superfund Site, OU3
Final 100% Remedial Design

h. Depth of bottom of hole.

-- End of Section --

SECTION 02 81 00

TRANSPORTATION AND DISPOSAL OF WASTE MATERIAL

PART 1 GENERAL

1.1 SCOPE OF WORK

Dispose of waste generated by site activities at EPA-approved facilities depending on waste characteristics. Facilities to potentially be used include Resource Conservation and Recovery Act (RCRA) Treatment Storage and Disposal Facilities (TSDFs), Subtitle C landfill(s), Subtitle D landfill(s), and a municipal landfills.

1.2 CONTRACTOR'S RESPONSIBILITIES

At a minimum, furnish all labor, material, equipment, and incidentals necessary for onsite preparation, offsite transportation, and offsite disposal of materials from the remediation and activities associated with the remediation. Waste materials refer to any and all materials including, but not limited to, drill cuttings, sediment from well development, water from well development, groundwater sampling and equipment decontamination, and any other waste due to construction activities. The Waste Management and Transportation Plan, based on the requirements of this section, must provide detailed methods of performing the work and disposing of waste.

Obtain any and all permits required for offsite transportation of waste in accordance with applicable Federal, State, and local regulations.

Perform all sampling required for disposal facility acceptance of waste in accordance with the sample requirements and methodology included in the Contractor's approved Uniform Federal Policy Quality Assurance Project Plan (UFP-QAPP), SECTION 01 35 45 - CHEMICAL DATA QUALITY CONTROL, and as required by the receiving offsite disposal facilities. Provide all waste profile information to the disposal facility, per the facility's requirements.

Ensure that all operations for loading and hauling of materials for disposal are in compliance with Federal and State Department of Transportation (DOT) regulations, 40 CFR 262 and 40 CFR 263, Environmental Protection Agency (EPA) OSWER Directive No. 9834.11, and all other applicable Federal, State, and local requirements.

Prepare and maintain waste shipment records and manifests required by the U.S. Federal Department of Transportation (DOT), and the New Jersey Department of Transportation (NJDOT).

1.3 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only. Where reference is made to one of these standards, the revision in effect at the time of contract award applies.

NEW JERSEY ADMINISTRATIVE CODE (NJAC)

N.J.A.C. 7:26

Solid and Hazardous Waste Management

Regulations

U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)

49 CFR 107	Hazardous Materials Program Procedures
40 CFR 261	Identification and Listing of Hazardous Waste
40 CFR 262	Standards Applicable to Generators of Hazardous Waste
40 CFR 263	Standards Applicable to Transporters of Hazardous Waste
40 CFR 264	Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities
40 CFR 265	Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities
40 CFR 268	Land Disposal Restrictions
40 CFR 270	EPA Administered Permit Programs: The Hazardous Waste Permit Program
40 CFR 300	National Oil and Hazardous Substances Pollution Contingency Plan
40 CFR 302	Designation, Reportable Quantities, and Notification
49 CFR 172	Hazardous Materials Table, Special Provisions, Hazardous Materials Communications, Emergency Response Information, and Training Requirements
49 CFR 173	Shippers - General Requirements for Shipments and Packagings
49 CFR 178	Specifications for Packagings

U.S. Code (U.S.C.)

33 U.S.C. 2701 et seq.	Oil Pollution Liability and Compensation
42 U.S.C. 6901 et seq.	Solid Waste Disposal
42 U.S.C. 9601 et seq.	Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)
49 U.S.C. 1801 et seq.	Hazardous Materials Transportation Act

U.S. Environmental Protection Agency (EPA)

OSWER Directive No. 9834.11	Procedures for Implementing Offsite Response Actions
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1.4 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals with an "FIO" designation are for information only. Submit the following to the Contracting Officer in accordance with SECTION 01 33 00 - SUBMITTAL PROCEDURES.

SD-01 Preconstruction Submittals

Waste Management and Transportation Plan; G

Waste Management and Transportation Plan in accordance with Paragraph 3.1.

SD-03 Product Data

Notices of Non-Compliance and Notices of Violation; G

Notices of non-compliance or notices of violation issued by a Federal, State, or local regulatory agency to the Contractor in relation to any work performed under this contract. Immediately provide copies of such notices to the Contracting Officer. Also furnish all relevant documents regarding the incident and any information requested by the Contracting Officer and coordinate the response to the notice with the Contracting Officer prior to submission to the notifying authority. Also furnish a copy to the Contracting Officer of all documents submitted to the regulatory authority, including the final reply to the notice, and all other materials, until the matter is resolved.

Contaminated Material Stockpile Reports; G

When contaminated materials are in interim storage, submit on a weekly basis an inventory of the types, quantity, and locations of all contaminated material in interim storage, and a record of the date, quantity, source, and disposition of all contaminated materials placed into or taken out of interim storage. Report all test results from sampling of stored material.

SD-06 Test Reports

Spill Response; G

In the event of a spill or release of a pollutant, contaminant, hazardous substance (as designated in 40 CFR 302), or oil (as governed by 33 U.S.C. 2701 et seq.), notify the Contracting Officer immediately. If the spill exceeds a reporting threshold, follow the pre-established procedures for immediate reporting to the Contracting Officer.

Recordkeeping; G

Submit information necessary to file state annual or EPA biennial reports in accordance with Paragraph 3.11.

Exception Report; G

In the event that a manifest copy documenting receipt of waste at

the disposal facility is not received within 35 days of shipment initiation, prepare and submit an exception report within 37 days of shipment initiation.

SD-07 Certificates

Transportation and Disposal Coordinator Qualifications; G

Transportation and Disposal Coordinator qualifications in accordance with Paragraph 1.7.1.

EPA Off-Site Policy; G

A letter certifying that EPA considers the facilities to be used for all off-site disposal to be acceptable in accordance with the off-site policy in 40 CFR 300, Section 440. Provide this certification for wastes from RCRA, 42 U.S.C. 6901 et seq., sites as well as from Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) (42 U.S.C. 9601 et seq.) responses. See Attachment A, sample certification, at the end of this section.

Certification; G

Copies of the current certificates of registration required by 49 CFR 107, Subpart G issued to the Contractor and/or Subcontractors or written statements certifying exemption from these requirements.

Training; G

Documentation that employees preparing or transporting hazardous materials have been trained, tested, and certified per 49 CFR 172, Subpart H, including general security awareness requirements and, where applicable, site-specific security plan requirements.

Transportation Certification; FIO

Certification that all vehicles to be used for transportation meet all existing Federal, State, and local regulations for vehicle operations.

Certificates of Disposal; G

Certificates documenting the ultimate disposal of contaminated wastes are required within 180 days of initial shipment. Receipt of these certificates are required for final payment.

Shipping Documents; G

All transportation-related shipping documents to the Contracting Officer including but not limited to the following: draft hazardous waste manifests, draft land disposal restriction notifications, lists of corresponding proposed labels, packages, marks, and placards to be used for shipment, waste profiles, supporting waste analysis documents, for review a minimum of 14 days prior to anticipated pickup. Furnish packaging assurances prior to transporting hazardous material; "generator copies" of hazardous waste manifests, "generator copies" of manifests used

for initiating shipments, supporting waste analysis documents when shipments are originated; and "receipt copies" of waste manifests at the designated disposal facility no later than 35 days after acceptance of the shipment.

1.5 DEFINITIONS

1.5.1 Hazardous Material

A substance or material which has been determined by the Secretary of Transportation to be capable of posing an unreasonable risk to health, safety, and property when transported in commerce, and which has been so designated pursuant to 49 U.S.C. 1801 et seq. The term includes materials designated as hazardous materials under the provisions of 49 CFR 172, Sections .101 and .102 and materials which meet the defining criteria for hazard classes and divisions in 49 CFR 173. EPA designated hazardous wastes are also hazardous materials.

1.5.2 Hazardous Waste

A waste which meets criteria established in RCRA or specified by the EPA in 40 CFR 261 or which has been designated as hazardous by a RCRA authorized state program.

1.5.3 Non-hazardous Waste

Any waste that does not meet the criteria of hazardous waste.

1.6 WASTE TYPES

Wastes that are expected to be generated during the remedial activities are summarized in Table 02 81 00-1.

Table 02 81 00-1 Expected Waste Types and Material to be Recycled	
Waste Type / Material to be Recycled	Description
Wastewater	Water associated with remedial activities including, but not limited to, well installation and development, and groundwater sampling activities. Wastewater is expected to be classified as hazardous waste, suitable for disposal at a RCRA Subtitle C landfill.
Decontamination wastewater	Water generated during equipment decontamination activities. Decontamination wastewater is expected to be classified as nonhazardous waste, suitable for disposal at a local publicly owned treatment works.
Drill cuttings	All soil cuttings. Material is expected to be classified as non-hazardous waste, suitable for disposal at a RCRA Subtitle D landfill.

Table 02 81 00-1 Expected Waste Types and Material to be Recycled	
Waste Type / Material to be Recycled	Description
Debris from clearing activities	Vegetation debris generated from clearing activities, suitable to be recycled at a New Jersey Class B Recycling facility.
Temporary facilities construction and demolition (C&D) debris	Debris generated from the removal of temporary facilities, suitable for recycling or disposal at a C&D landfill.
Refuse from amendment injections	Empty amendment containers suitable for recycling

1.7 QUALITY ASSURANCE

1.7.1 Transportation and Disposal Coordinator (TDC)

Designate, by position and title, one person to act as the TDC for this contract. The TDC must serve as the single point of contact for all environmental and regulatory matters and have the responsibility for total environmental compliance at the site including, but not limited to, accurate identification and classification of waste material to be disposed off-site; determination of proper shipping names; identification of marking, labeling, packaging, and placards requirements; completion of waste profiles, waste manifests, completion of EPA Region 2 Offsite Rule form, bill of landings, exception and discrepancy reports; and all other environmental documentation. The TDC must have at least one year of specialized experience in the management and transportation of hazardous waste and have been Department of Transportation certified under 49 CFR 172, Subpart H.

1.7.2 Training

The Contractor's hazardous materials employees must be trained, tested, and certified to safely and effectively carry out their assigned duties in accordance with SECTION 01 35 29 - HEALTH, SAFETY, AND EMERGENCY RESPONSE PROCEDURES. The Contractor's employees transporting hazardous materials or preparing hazardous materials for transportation, including samples, must be trained, tested, and certified in accordance with 49 CFR 172, Subpart H, including security awareness and any applicable security plans. Contractor employees making determinations that shipments do not constitute DOT-regulated hazardous materials must also be trained, tested, and certified in accordance with 49 CFR 172, Subpart H.

1.7.3 Certification

The Contractor and/or subcontractors transporting hazardous materials must possess a current certificate of registration issued by the Research and Special Programs Administration (RSPA), U.S. DOT, when required by 49 CFR 107, Subpart G.

1.7.4 Laws and Regulations Requirements

Comply with Federal, state, and local laws and regulations which are

applicable. These requirements are amended frequently and compliance with amendments is required as they become effective. Notify the Contracting Officer immediately if compliance exceeds the scope of work or conflicts with specific requirements of the contract. At a minimum the requirements stipulated in the regulations referenced in Paragraph 1.3 must be met.

Comply with 40 CFR 268 when treating and disposing of hazardous wastes, if encountered.

PART 2 PRODUCTS

Provide all the materials required for the packaging, labeling, marking, placarding and transportation of hazardous and non-hazardous wastes materials in conformance with Department of Transportation standards. Details in this specification must not be construed as establishing the limits of the Contractor's responsibility.

2.1 CONTAINERS

All drums must be DOT 17H or 17E as per 49 CFR 178.

2.2 MARKINGS

Provide markings, where not excepted by 49 CFR 173, Subpart I, for each contaminated material package, freight container, and transport vehicle consistent with the requirements of 49 CFR 172, Subpart D. Markings must withstand a 180 day exposure to conditions reasonably expected to be encountered during container storage and transportation, without deterioration or substantial color change.

2.3 LABELING

Provide primary and subsidiary labels for contaminated materials, where not excepted by 49 CFR 173, Subpart I, consistent with the requirements in the Hazardous Materials Table in 49 CFR 172, Section .101, Column 6. Labels must meet design specifications required by 49 CFR 172, Subpart E including size, shape, color, printing, and symbol requirements. Labels must be durable weather resistant and withstanding a 180 day exposure to conditions reasonably expected to be encountered during container storage and transportation, without deterioration or substantial color change.

2.4 PLACARDS

For each off-site shipment of contaminated materials, provide primary and subsidiary placards, where not excepted by 49 CFR 173 Subpart I, consistent with the requirements of 49 CFR 172, Subpart F. Placards must be provided for each side and each end of bulk packaging, freight containers, transport vehicles, and rail cars requiring such placards. Placards may be plastic, metal, or other material capable of withstanding, without deterioration, a 30-day exposure to open weather conditions and must meet design requirements specified in 49 CFR 172, Subpart F.

2.5 SPILL RESPONSE MATERIALS

Provide spill control materials and equipment which are sufficient to meet the requirements described in Section 01 35 29 - HEALTH, SAFETY, AND EMERGENCY RESPONSE PROCEDURES. Provide spill response materials including, but not limited to, containers, adsorbent, shovels, and personal protective equipment. Spill response materials must be available at all

times when hazardous materials/wastes are being handled or transported. Spill response materials must be compatible with the type of material being handled.

2.6 EQUIPMENT AND TOOLS

Provide miscellaneous equipment and tools necessary to handle wastes in a safe and environmentally sound manner.

PART 3 EXECUTION

3.1 WASTE MANAGEMENT AND TRANSPORTATION PLAN

Prepare and submit to the Contracting Officer a Waste Management and Transportation Plan, which must include, at a minimum, the following:

- a. Procedures proposed for the accomplishment of the work including details of the manner in which drill cuttings, wastewater (non-hazardous or hazardous), and other potential federal and state regulated waste will be managed and the related practices that will be utilized.
- b. Waste minimization methods.
- c. Details regarding the types and sizes of all transport vehicles and equipment to be used by the waste hauler
- d. Waste characterization methods to be employed including those required for both meeting DOT shipping criteria but also the designated disposal facility's requirements.
- e. Names, locations, and telephone numbers for proposed landfill facilities for waste disposal for each type of waste. Include alternate facilities in the event that the primary facility cannot accept the waste.
- f. Certificates, permits, licenses, and EPA or state agency identification (ID) numbers for the proposed disposal facilities and waste haulers.
- g. Waste classification and volume estimates for the waste types, if existing sample results are sufficient for disposal facility acceptance. Otherwise, the requirements to conduct waste characterization sampling to meet disposal facility acceptance requirements.
- h. Letters of commitment from the proposed waste haulers and disposal facilities, certifying acceptance of the White Chemical Corporation Superfund Site, OU3 waste.
- i. Methods and equipment to be used to ensure accurate weight measurements of waste material.
- j. Waste manifesting procedures.
- k. Locations and procedures for the on-site waste handling areas.
- l. Whether transfer facilities are to be used and if so the shipment tracking systems to be employed.

- m. Transportation and Disposal Coordinator name.
- n. Proposed truck routes from the site to the disposal and recycling facilities. The routes to and from the disposal facilities must be in accordance with the disposal facility's requirements and all Federal, State and local regulations, laws, ordinances, and weight restrictions. For proposed truck routing, investigate the adequacy and condition of existing roads, the overhead clearance, and allowable load limit on these roads.
- o. All aspects and considerations for waste transportation hazards that will be involved during hauling operations including, but not limited to, the following: procedures for incident response, methods to contain and clean up spills, details of manpower and equipment available, the coordination necessary to mobilize forces in an emergency, and traffic maintenance/warning procedures. Responses must be implemented within one hour following any accident or release of contaminated material, as directed by the Contracting Officer.
- p. Proposed business entity qualified to respond to hazardous material transport spills.
- q. Types of vehicles that will be used for each type of waste.
- r. A description of proposed transportation methods and procedures for hauling waste material, including type of vehicles that will be used for each type of waste.

3.2 GENERAL

Coordinate the schedule for container delivery and waste disposal to meet the approved project schedule. Coordinate recording quantities of waste leaving the site with the Contracting Officer. Coordinate the schedule with the progress of RA activities and with the availability of equipment and personnel for material handling operations.

Organize and maintain the material shipment records required by the Federal and state.

The Contractor is responsible for obtaining and filling out waste profile sheets required by the disposal facility. The quantity of sheets per contained waste must be in accordance with Federal, State, or local regulations. Submit each disposal site approved profile sheet to the Contracting Officer.

As part of the Waste Management and Transportation Plan, describe elements to be employed to protect wastes stored on site from vandalism or natural weather events.

Ensure that all transport vehicles containing waste are covered before leaving the site.

Utilize transporters having proper EPA identification numbers and NJDEP hauler registrations, and must assure through the manifest system that the waste arrives at the authorized offsite disposal facility. Report to the Contracting Officer any shipments that do not reach the disposal facility.

Notify the Contracting Officer immediately upon learning that a

job-related accident has occurred. Notification of the accident must include location of the accident, resultant damage or injury, person(s) involved, probable cause, amount of waste spilled, and any other pertinent information concerning the accident.

Provide transportation of waste directly to the disposal facility/facilities.

3.3 CHARACTERIZATION OF WASTE MATERIALS

Perform all waste characterization sampling and testing required for acceptance of wastes at the designated disposal facilities in accordance with all applicable Federal, State, and local regulations and as specified SECTION 01 35 45 - CHEMICAL DATA QUALITY CONTROL. Describe proposed characterization methods and processes in the Contractor's UFP-QAPP.

3.4 WASTE CLASSIFICATION

Identify, in consultation with the Contracting Officer, all waste codes applicable to each hazardous waste stream based on requirements in 40 CFR 261 or applicable state or local law or regulation. Also identify applicable treatment standards in 40 CFR 268 and state land disposal restrictions and make a determination as to whether or not the waste meets or exceeds the standards. Submit waste profiles, analyses, classification and treatment standards information to Contracting Officer for review and approval.

The Contractor is responsible for segregating all wastes generated as a result of construction and remedial activities by waste type and classifications.

3.5 ONSITE NON-HAZARDOUS WASTE MANAGEMENT

Dispose of nonhazardous waste from the site offsite in an approved landfill in accordance with the approved Waste Management and Transportation Plan and New Jersey Solid Waste Regulations (N.J.A.C. 7:26).

Load solid waste material, including soil cuttings, into roll-off containers using a loading system approved by the Contracting Officer.

Collect liquid waste material, decontamination water, purge water from groundwater sampling, and well development water, in storage tanks or drums. Store decontamination water separately from the purge water and well development water that may be classified as hazardous waste.

The Contractor is responsible for determining if the wastes are non-hazardous or hazardous and is responsible for acceptance of the material at an approved disposal facility.

3.6 ONSITE HAZARDOUS WASTE MANAGEMENT

Coordinate the onsite management of all hazardous materials and waste with the Contracting Officer. The Contractor is responsible for ensuring compliance with Federal, state, and local hazardous waste laws and regulations and verifying those requirements when preparing reports, waste shipment records, hazardous waste manifests, or other documents.

If water generated onsite is classified as hazardous based on characterization sampling, the Contractor may propose to treat the

hazardous water on-site and dispose treated water off site as non-hazardous. It is the Contractor's responsibility to obtain all necessary permits required for on-site treatment. The Contractor must provide all information on this approach in the Waste Management and Transportation Plan and submit to the Contracting Officer for approval.

3.6.1 Hazardous Waste Classification

Perform any and all sampling required for acceptance of waste material in accordance with the Contractor's approved UFP-QAPP and SECTION 01 35 45 - CHEMICAL DATA QUALITY CONTROL. Provide all waste profile information to the offsite disposal facility, per their requirements. Sampling and field screening methods must be in accordance with disposal facility requirements and applicable Federal, State and local regulations. Complete waste profile information and submit it to the Contracting Officer for approval prior to sending it to the disposal facility.

Identify hazardous wastes using criteria set forth in 40 CFR 261 or applicable state and local laws, regulations, and ordinances. Identify all applicable treatment standards in 40 CFR 268 and state LDRs and make a determination as to whether or not the waste meets or exceeds the standards. Submit waste profiles, analyses, classification, and treatment standards information to the Contracting Officer for review and approval.

3.6.2 Hazardous Waste Storage

Comply with generator requirements in 40 CFR 262 and applicable state or local law or regulations when accumulating hazardous waste onsite. Restrict onsite accumulation times to applicable time frames referenced in 40 CFR 262, Section .34 and applicable state or local law or regulation. Accumulation start dates commence when waste container is transferred into a 90 day accumulation site or permitted storage facility. Only use containers in good condition and compatible with the waste to be stored. Ensure containers are closed except when adding or removing waste, and immediately mark all hazardous waste containers with the words "hazardous waste" and other information required by 40 CFR 262, Section .32 and applicable state or local law or regulation as soon as the waste is containerized. Inspect containers for signs of deterioration and for responding to any spills or leaks. Inspect all hazardous waste areas weekly and provide written documentation of the inspection. Include date and time of inspection, name of individual conducting the inspection, problems noted, and corrective actions taken on the inspection logs.

3.6.3 Sampling of Stored Material

Collect samples of contaminated material at a frequency consistent with the requirements of the offsite disposal facility. Analyze the stored material for disposal purposes. Analytical levels for contaminated waste material to be taken to an offsite disposal facility must conform to Federal, State and local criteria as well as to the requirements of the offsite disposal facility. Furnish documentation of all analyses performed to the Contracting Officer.

3.7 LOADING

Provide equipment that is appropriate to accomplish this type of work and maintain and use it in strict compliance with Occupational Safety and Health Administration (OSHA) requirements. Take all necessary precautions for safe operation of the equipment and the protection of the public from

injury and damage from such equipment.

Load materials into the proper transport containers and trucks using a loading system approved by the Government.

Load transport containers and trucks in such a manner as to prevent the spreading of contaminated material to uncontaminated areas and minimize production of dust.

Prevent water intrusion into the transport container or conveyance during loading.

Chain truck tailgates shut to prevent opening during transit.

3.8 OFFSITE CONTAMINATED MATERIAL MANAGEMENT

3.8.1 Treatment, Storage, and Disposal (TSD) Facility and Transporter

Provide the Contracting Officer with EPA ID numbers or State Agency License numbers, names, locations, and telephone numbers of TSD facilities and transporters. This information must be contained in the Hazardous Waste Management Plan and be approved by the Contracting Officer prior to waste disposal.

3.8.2 Facility Status Information

Facilities receiving hazardous waste must be permitted in accordance with 40 CFR 270 or operating under interim status in accordance with 40 CFR 265 requirements, or permitted by a state authorized by the Environmental Protection Agency to administer the RCRA permit program. Additionally, prior to using a TSD Facility, contact the EPA Regional Offsite Coordinator specified in 40 CFR 300, Section .440, to determine the facility's status, and document all information necessary to satisfy the requirements of the EPA Offsite policy and submit this information to the Contracting Officer in the Hazardous Waste Management Plan.

3.8.3 Shipping Documents and Packaging Certification

Ensure that each shipment of waste sent offsite is accompanied by properly completed shipping documents. This includes shipments of samples that may potentially meet the definition of a Department of Transportation regulated hazardous material.

Prior to shipment of any hazardous material offsite and a minimum of 14 days prior to anticipated pickup, provide for review written certification to the Contracting Officer that hazardous materials have been properly packaged, labeled, and marked in accordance with Department of Transportation and EPA requirements. Furnish designated disposal facility packaging assurances not later than 35 days after acceptance of the shipment. The Contractor's TDC must also provide written certification regarding waste minimization efforts documenting that efforts have been taken to reduce the volume and toxicity of waste to the degree economically practicable and that the method of treatment, storage, or disposal selected minimizes threats to human health and the environment.

3.8.4 Transportation

Decontaminate all vehicles using the decontamination pad before they leave the site in accordance with the Contractor's approved Accident Prevention

Plan (APP), as described in SECTION 01 35 29 - HEALTH, SAFETY, AND EMERGENCY RESPONSE PROCEDURES. Inspect all vehicles leaving the project site to ensure that no soil adheres to its wheels or undercarriage. Remove all excess soil at the vehicle decontamination pad. Keep all local roads free of contaminated and uncontaminated soil and debris.

Utilize transporters having proper DOT registration and identification numbers and assure through the manifest system that the waste arrives at the authorized off-site disposal facility. Report to the Contracting Officer any shipments that do not reach the disposal facility. All transporters operating within New Jersey must have an A-901 license.

Manifests requiring shipper's certification number must be signed by the EPA Region 2 remedial project manager.

Monitor each transport vehicle for external contamination prior to leaving the worksite. Perform and document decontamination procedures prior to leaving the worksite and again before leaving the disposal site.

3.8.4.1 Non-hazardous wastes

Use manifests for transporting non-hazardous wastes as required by 40 CFR 263 or applicable state or local law or regulation. Transportation must comply with all requirements in the Department of Transportation referenced regulations in the 49 CFR series. Prepare non-hazardous waste manifests for each shipment of non-hazardous waste shipped offsite. Complete manifests using instructions in 40 CFR 262, Subpart B and applicable state or local law or regulation. Submit manifests and waste profiles to Contracting Officer for review and approval. Submit notifications with the manifest to the Contracting Officer for review and approval. A detailed report documenting the final disposal of all materials removed from the site shall be submitted to the Contracting Officer.

Provide as part of the Waste Management and Transportation Plan the arrangements made for twenty-four-hour response to any transport accident involving waste shipments from the site. See Paragraph 3.13 below for detailed requirements for Off-Site Emergency Response.

3.8.4.2 Hazardous Wastes

Prior to conducting hazardous materials activities, either certify to the Government that a Security Plan is in place which meets the requirements of 49 CFR 172, Subpart I or, in the event that the types or amounts of hazardous materials are excluded from the security planning requirements, provide a written statement to that effect detailing the basis for the exception. Use manifests for transporting hazardous wastes as required by 40 CFR 263 or applicable state or local law or regulation. Transportation must comply with all requirements in the Department of Transportation referenced regulations in the 49 CFR series. Prepare hazardous waste manifests for each shipment of hazardous waste shipped offsite. Complete manifests using instructions in 40 CFR 262, Subpart B and applicable state or local law or regulation. Submit manifests and waste profiles to the Contracting Officer for review and approval. Prepare land disposal restriction notifications as required by 40 CFR 268 or applicable state or local law or regulation for each shipment of hazardous waste. Submit notifications with the manifest to the Contracting Officer for review and approval.

3.8.5 Truck Routes and Truck Route Maintenance

Follow truck route defined in the approved Waste Management and Transportation Plan. Deviation from the transportation routes must receive written approval from the Contracting Officer.

Periodically inspect all routes nearby the site that the vehicles take from site to the disposal facilities used for evidence of leakage or tracking of mud. Inspect paved haul routes daily for cleanliness and other damage from Contractor activities. The Contractor is responsible for any and all actions necessary to remedy situations involving material spilled in transit or mud and dust tracked off-site. Clean from the surface any dirt or mud that is tracked onto paved or surfaced roadways.

3.8.6 Disposal

3.8.6.1 General

Coordinate the proposed modes of transportation and scheduling and notification of all shipments with the disposal facility. Notify the Contracting Officer in writing of any problems or issues which occur during transportation to the disposal location. Include in this notification any damage to containers during transportation and any scheduling conflicts with the disposal contractor which adversely impact project schedule or cost.

The Contractor is responsible for all wastes until they are accepted by the disposal facility. Ensure the physical integrity of shipments from the time the containers leave the site until they are accepted by the disposal contractor. Ensure that all waste shipments are in compliance with the disposal contractor requirements at the time of receipt of the shipments at the disposal facility.

Maintain communication throughout the transportation process associated with each shipment to ensure adequate notification of scheduled arrival times for containers reaching the site. It is anticipated that the disposal contractor will release containers for shipment back to the site within 7 calendar days from the time containers are accepted by the disposal contractor. The Contractor is responsible for all delays in turnaround time for containers which result from non-conforming shipments, manifesting problems, or inadequate coordination by the Contractor with the disposal Contractor.

Submit Certificates of Disposal documenting the ultimate disposal, destruction or placement of CERCLA remediation waste within 180 days of initial shipment. Receipt of these certificates is required for final payment.

3.8.6.2 Treatment and Disposal of Hazardous Waste

Coordinate the off site transfer of all hazardous materials and waste with the Contracting Officer. Use RCRA Subtitle C permitted facilities which meet the requirements of 40 CFR 264 or facilities operating under interim status which meet the requirements of 40 CFR 265. Do not use offsite treatment, storage, and disposal facilities with significant RCRA violations or compliance problems (such as facilities known to be releasing hazardous constituents into ground water, surface water, soil, or air). Propose the TSD facility(ies) in the Waste Management and Transportation Plan. All TSD facility(ies) must be accepted by the

Contracting Officer. Submit Notices of Non-Compliance and Notices of Violation by a Federal, state, or local regulatory agency issued to the Contractor in relation to any work performed under this contract. Immediately provide copies of such notices to the Contracting Officer. Also furnish relevant documents regarding the incident and any information requested by the Contracting Officer, and coordinate the response to the notice with the Contracting Officer or the designated representative prior to submission to the notifying authority. Also furnish a copy to the Contracting Officer of all documents submitted to the regulatory authority, including the final reply to the notice, and all other materials, until the matter is resolved.

Do not deliver waste to any facility other than those listed on the shipping manifest. In the event that the identified and approved facility(ies) ceases to accept the stated materials or the facility(ies) ceases operations, it is the Contractor's responsibility to locate additional alternate facility(ies) for approval. The Contractor is responsible for making the necessary arrangements to utilize the facility(ies). The additional alternate facility(ies) must be approved in writing by the Contracting Officer in the same manner and with the same requirements for the original facility(ies).

3.9 EPA ID NUMBERS

EPA Region II will provide waste generator identification number for use on the manifests.

3.10 WASTE MINIMIZATION

Minimize the generation of waste to the maximum extent practicable and take all necessary precautions to avoid mixing clean and contaminated wastes. Submit written certification that waste minimization efforts have been undertaken to reduce the volume and toxicity of waste to the degree economically practicable and that the method of treatment, storage, or disposal selected minimizes threats to human health and the environment.

3.11 RECORDKEEPING

Organize and maintain the shipment records/manifests required by 42 U.S.C. 6901 et seq., the State of New Jersey, and the state in which the disposal facility is located.

Maintain adequate records to support information provided to the Contracting Officer regarding exception reports, annual reports, and biennial reports.

3.12 ACCIDENTS AND SPILL RESPONSE

Notify the Contracting Officer immediately upon learning that a transportation-related accident has occurred. Notification of the accident must include location of the accident, resultant damage or injury, person(s) involved, probable cause, amount of waste, if any, spilled, and any other pertinent information concerning the accident.

Accident cleanup operations must be performed by a business entity qualified to respond to hazardous material transport spills. Perform cleanup immediately.

Respond to any spills of hazardous material or hazardous waste which are

in the custody or care of the Contractor, pursuant to this contract. In the event of a spill or release of a hazardous substance (as designated in 40 CFR 302), or pollutant or contaminant, or oil (as governed by the Oil Pollution Act (OPA), 33 U.S.C. 2701 et seq.), notify the Contracting Officer immediately. Direction from the Contracting Officer concerning a spill or release is not considered a change under the contract. If the spill exceeds a reporting threshold, follow the pre-established procedures for immediate reporting to the Contracting Officer. Comply with applicable requirements of Federal, state, or local laws or regulations regarding any spill incident.

3.13 EMERGENCY CONTACTS

Comply with the emergency contact provisions in 49 CFR 172, Section .604. Whenever the Contractor ships hazardous materials, provide a 24 hr emergency response contact and phone number of a person knowledgeable about the hazardous materials being shipped and who has comprehensive emergency response and incident mitigation information for that material, or has immediate access to a person who possesses such knowledge and information. Monitor the phone on a 24 hour basis at all times when the hazardous materials are in transportation, including during storage incidental to transportation. Ensure that information regarding this emergency contact and phone number are placed on all hazardous material shipping documents. Designate an emergency coordinator and post the following information at areas in which hazardous wastes are managed:

- a. The name of the emergency coordinator.
- b. Phone number through which the emergency coordinator can be contacted on a 24-hour basis.
- c. The telephone number of the local fire department.
- d. The location of fire extinguishers and spill control materials.

-- End of Section --

SAMPLE OFF-SITE POLICY CERTIFICATION MEMO

Project/Contract #:

Waste Stream:

Primary TSD Facility, EPA ID # and Location:

Alter. TSD Facility, EPA ID # and Location:

EPA Region Contact

I	888-372-7341
II	212-673-4040
III	800-438-2474 or 215-814-5000
IV	800-241-1754 or 404-562-9900
V	312-353-2000
VI	800-887-6063 or 214-665-2210
VII	800-223-0425
VIII	800-424-8802
IX	415-947-8713
X	800-424-4372 or 206-553-4973

EPA representative contacted:

EPA representative phone number:

Date contacted:

Comment:

The above EPA representative was contacted on _____. As of that date the above sites were considered acceptable in accordance with the Off-Site Policy in 40 CFR 300.440.

Signature:

Date:

Phone number:

SECTION 13 30 00

AMENDMENT INJECTION SYSTEM AND OPERATION

PART 1 GENERAL

1.1 SCOPE OF WORK

The overall goal for the injection in the overburden and bedrock is to effectively distribute amendments (sodium lactate and/or zero valent iron [ZVI] with organics as defined herein and approved by the Contracting Officer) throughout the treatment zone for enhanced anaerobic bioremediation (EAB) of site contaminants. Prior to amendment injection activities, groundwater screening, monitoring well installation, and baseline sampling will be conducted to refine the treatment area and vertical extent for treatment. Details for groundwater screening, monitoring wells installation, development and sampling are provided in SECTION 02 32 13 - SUBSURFACE DRILLING AND SAMPLING, SECTION 01 80 00 - PERFORMANCE SAMPLING AND ANALYSIS, and SECTION 33 51 39 - MONITORING WELLS.

The treatment area encompasses the entire White Chemical Corporation (WCC) property with the horizontal extent of treatment area bounded by 1,2-dichloroethane (1,2-DCA) concentrations greater than 100 micrograms per liter ($\mu\text{g/L}$) and the portion of the 646 Frelinghuysen Avenue property with the horizontal extent of treatment area bounded by 1,2-DCA concentrations greater than 1,000 $\mu\text{g/L}$ and the vertical extent on both properties bounded by a 1,2-DCA concentration greater than 100 $\mu\text{g/L}$. The treatment zone will be refined based on groundwater screening results.

Perform amendment injection within the treatment area and vertical treatment interval in accordance with the approved Amendment Injection Work Plan.

One round of injection is planned for both the overburden and bedrock aquifers. A second round of overburden injection may be conducted based on the Round 2 and 3 overburden performance monitoring data and as directed by the Contracting Officer. Conduct the second round of overburden injections in accordance with the approved Amendment Injection Work Plan and per direction from the Contracting Officer.

Contact the City of Newark, Department of Sewer and Water for approval to use city water from a fire hydrant located along Frelinghuysen Avenue to support the amendment injection operation.

Conduct overburden amendment injection using the direct push technology (DPT) drilling method. Complete overburden amendment injections using a hydraulic or pneumatic injection method; select the most cost efficient injection method. Propose the injection method in the Amendment Injection Work Plan for review and approval.

Conduct injections into bedrock wells using either a gravity feed system or a low pressure injection system. A low-pressure injection system may be needed, as directed by the Contracting Officer, if the gravity feed system is prolonging bedrock injections or if a large volume of amendment needs to be injected into a bedrock well.

Abandon each temporary injection borehole using cement grout as indicated

herein.

Furnish all required labor, amendment, equipment and incidentals, including electrical and instrumentation, whether specified herein or not, to provide fully functional and operational amendment injection systems and to successfully complete the amendment injection operations.

Furnish and maintain a minimum of two injection crews. Furnish and maintain a minimum of one set of injection systems for lactate injection if it can be used for both overburden and bedrock injection, and one set of injection systems for injecting ZVI with organics amendment in order to meet the overall project schedule within the 5-year period of performance of the contract. Supply a second set of injection systems for injecting ZVI with organics amendment if required in order to meet the project schedule. Performance requirements for basic equipment, such as pumps, flow meters, pressure gauges, mixing tanks, scale, and piping are specified herein. Design and construct the injection system in compliance with all applicable standards based on the performance requirements specified herein.

Monitor system performance and record and maintain amendment injection records during injection operations to assess system performance as specified herein and adequately document the required operations.

The Contractor must be responsible for protection and security of their equipment on site and for protection of existing site features such as, but not limited to, existing wells and fencing.

Perform the amendment injection operations in accordance with requirements in SECTION 01 35 29 - HEALTH, SAFETY AND EMERGENCY RESPONSE PROCEDURES and the approved health and safety plan.

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals with an "FIO" designation are for information only. Submit the following to the Contracting Officer in accordance with SECTION 01 33 00 - SUBMITTAL PROCEDURES.

SD-01 Preconstruction Submittals

Amendment Injection Work Plan; G

Within 30 days prior to the start of injections, submit for approval an Amendment Injection Work Plan to demonstrate full understanding of the injection operations for both the overburden and bedrock injections. This work plan must include the following information at a minimum:

- a. Detailed injection approach, including specific injection locations, amendment selection for each injection location (noting any differences in amendment selection for different vertical depth intervals), injection dosing (noting any differences in amendment dosing for different vertical depth intervals), injection borehole spacing, and injection sequencing.
- b. Staging areas for delivery and temporary storage of amendment, and for short-term and long-term storage of injection systems when not in use.

- c. Schematic diagrams and drawings of the injection systems including the following: process flow diagram, piping and instrumentation diagrams, and equipment layout of the injection systems, which must include, but are not limited to: amendment stock solution transfer pumps, chemical mixing tanks, method of mixing, injection solution delivery systems, injection hose, injection manifold, injection well head assembly, flow meters, flow totalizers, pressure gauges, scales, DPT rig, and the injection tools. Include the following information for each piece of equipment, as applicable: manufacturer literature and model numbers, equipment size and dimensions, design capacity (e.g., flow rate and total dynamic head (TDH) for pumps, flow range for flow meters, pressure range for pressure gauges, etc.), utility requirements, materials of construction and weight, pump curves where applicable, and piping and hose size and construction materials.
- d. Different injection systems must be provided as necessary, for injecting lactate solution and for injecting ZVI with organics slurry, respectively. Injection within the same borehole may require the use of both injection systems for different vertical intervals based on contaminant concentrations. The lactate injection system(s) must be capable of injecting lactate solution into overburden under high pressure and injecting lactate solution into bedrock by gravity or under low pressure.
- e. Detailed operation procedures for amendment injections, which must include, but are not limited to, the following:
 - (1) Equipment and method for storage, transportation and mixing of city water and amendments to injection staging area and injection locations.
 - (2) Injection operation procedures: sequence of injections at each designated area, staging of injection systems and mixing tanks during injection, startup and shut down procedures, leak testing procedure, injection solution preparation, injection process and borehole abandonment.
 - (3) Injection operation procedure for bedrock, similar information to the overburden injections.
 - (4) Procedure for control of daylighting, spills and excessive pressure built-up during pressure injections.
- f. Site management including labor requirements and qualifications of operators.
- g. Spill Prevention Plan in accordance with the requirements of SECTION 01 57 19 - TEMPORARY ENVIRONMENTAL CONTROLS.
- h. Quality control measures.
- i. Forms for daily tracking of injection progress.
- j. Calculations, sizing of the mixing tanks, quantity of amendment to be added in each batch solution for preparing recommended amendment dosage and estimated days of injection.

SD-03 Product Data

Amendment Data Sheet; G

Submit the specification of the sodium lactate and ZVI with organics amendment to be used.

SD-11 Closeout Submittals

Amendment Injection Record; G

The amendment injection record for overburden injection must include the quantity of sodium lactate, the approved ZVI with organics amendment, and city water injected into each interval, depth intervals of injection at each location, start time, end time, flow rate and pressure of injection for each interval, daily usage of water from the meter at the hydrant, surfacing, and measures to control surfacing. Provide the minimum, maximum, and average flow rates and pressures for each injection interval, at a minimum. If the target injection volume was not achieved at an injection location, provide the reason why. If re-injection is performed, state the borehole and interval in which reinjection was performed to address the issue.

For bedrock injection, the amendment injection record must include daily volumes of sodium lactate and potable water injected into each bedrock well, the cumulative injection volumes at each bedrock well, injection method (i.e., gravity feed or low pressure injection), the pressure reading if applicable, and injection rates.

The submittal must include a sketch of injection boring locations. Additionally, submit a complete amendment injection record at the end of overburden injection operation and a complete amendment injection record at the end of bedrock injection operation.

1.3 QUALITY ASSURANCE

Provide standard equipment, modified as required, and manufactured by companies whose products have commercially available replacement parts and have had similar units in service for not less than five years.

1.4 QUALIFICATIONS

Provide sufficient number of qualified field personnel to complete overburden and bedrock injections. Provide a site superintendent to manage the daily operation and communicate with the Contracting Officer. At a minimum, provide a New Jersey-licensed driller to operate the DPT rig.

The injection contractor must have three years of experience or have conducted injections of ZVI with organics amendment at a minimum of three other projects of similar scale. Provide the following information for the injection contractor: qualifications, years of experience, and project information and references for three similar projects where high pressure injections of ZVI with organics amendment were performed.

1.5 PERMITS

Obtain the necessary permits for drilling and injections in accordance with Federal, State, and local regulatory requirements, including the NJDEP permit equivalent for discharges to groundwater.

1.6 MATERIAL DELIVERY, STORAGE, AND HANDLING

Arrange for the freight to the site and on- and off- loading of all system equipment and amendment shipped to the site.

To the extent possible, all equipment must be delivered on transportable structural steel skids or in a trailer to the site pre-piped and pre-wired.

Inform the Contracting Officer of the delivery date/time of each injection system at least two working days prior to delivery, so that the Government can oversee the erection and initial testing of the injection systems.

The equipment/amendment must be shipped, delivered, handled, stored, and installed in ways that will prevent damage to the items.

The equipment/amendment must be delivered to the site free of contamination. Once the injection system is assembled, the Contractor must demonstrate to the Contracting Officer's representative that the system is clean, free of leak, and ready to be used.

Provide means to keep the 60% sodium lactate solution in secondary containment with a minimum 110% spill volume capacity of the largest container stored in the secondary containment.

Provide ZVI with organics amendment in enclosed containers (e.g. pods or mobile minis) protected from freezing and direct contact with water during the project duration.

1.7 REGULATORY REQUIREMENTS

The Contractor must comply with all the laws, ordinances, codes, rules, and regulations of the Federal, State, and local authorities having jurisdiction over any of the work specified herein.

PART 2 PRODUCTS

2.1 TREATMENT AREA AND VOLUME

The areal extent of the treatment area at the site is 286,000 square feet (the area at the WCC and 646 Frelinghuysen Avenue properties are approximately 200,000 square feet and 86,000 square feet, respectively). The treatment volume in this area is estimated at 174,900 cyd.

The injection locations are divided into subgroups as shown on the Contract Drawings. The estimated total treatment volume for the site for each 1,2-DCA concentration range is provided on Table 13 30 00-1.

2.2 AMENDMENT SELECTION, DOSAGE, AND QUANTITY

Provide the amendments (sodium lactate and ZVI with organics amendment) meeting the below requirements for each amendment. These quantities will be updated based on the results of groundwater screening as directed by the Contracting Officer.

The estimated quantities of lactate and ZVI with organics amendment and the quantity of proposed injection volumes for the site are presented on Table 13 30 00-1. The treatment area and volume are subject to change based on groundwater screening results and as approved by the Contracting Officer.

2.2.1 Sodium Lactate

Sodium lactate 60% solution is used herein to specify the requirements. Lactate at a different concentration may be proposed for Contracting Officer's approval. Procure sodium lactate at in liquid form in 275 gallon totes having a density ranging from 1.31 to 1.34 grams per milliliter (gm/ml) at 25°C. The lactate must contain 0.25 mg/L or higher concentration of vitamin B12. The lactate must be food grade or above (Food Chemicals Codex, 7th Edition or later) and must contain minimal impurities. Inorganic impurities in the 60% lactate solution must not exceed the below limits:

- a. Chloride: 0.05% by weight
- b. Chromium: 2 mg/kg
- c. Cyanide: 0.5 mg/kg
- d. Lead: 2 mg/kg
- e. Sulfate: 0.005% by weight

2.2.2 ZVI with Organics Amendment

Procure ZVI with organics amendment approved by the Contracting Officer. The ZVI with organics amendment may be in dry powder form in 50 pound (lbs) bags containing the following ingredients:

- a. ZVI: 30-48% by weight with particle size ranges from 50 to 250 microns
- b. Slow-release complex organic carbon source (cellulolytic plants): 52-70% by weight
- c. Binding agent to ensure the ZVI and organics stay in suspension: 2% by weight
- d. Viscosity modifier: 0-5% by weight
- e. Organic carbon in the product classified as "food grade"
- f. Overall blend must be nonhazardous.

2.2.3 Amendment Dosage

2.2.3.1 Overburden Amendment Dosage

Inject amendment (sodium lactate or ZVI with organics amendment) as discussed below for overburden injections. Mix ZVI with organics amendment or lactate with city water to prepare the proposed dosage. Dosage of sodium lactate is based on 100% sodium lactate.

Mix amendment products with water and inject amendment solutions to obtain target dosages as indicated in Table 13 30 00-1 based on contaminant concentration ranges.

Because 1,2-DCA greater than 20,000 µg/L are not anticipated, an injection zone based on this concentration range is not shown on the Contract Drawings. However, this will be determined following review of the results

of the groundwater screening and baseline sampling. For concentrations of 1,2-DCA greater than 20,000 µg/L, dose the ZVI with organics amendment at 25 lbs per cyd of treatment volume.

Because the dosing of ZVI with organics amendment for different concentration ranges varies, the injection volume will also vary. Track the quantity of EHC injected as well as the volume of ZVI with organics amendment slurry injected.

Because 1,2-DCA concentrations vary laterally as well as vertically, the amendment and its necessary dosing will vary between injection points and within injection points between different vertical injection intervals. Dosing of lactate and ZVI with organics amendment is subject to change based on the results of the groundwater screening and baseline sampling.

2.2.3.2 Bedrock Amendment Dosage

The design volume of 30% sodium lactate for bedrock wells MW-1B1, MW-1B2, MW-6B1, MW-6B3, MW-6B4, and newly constructed bedrock wells (MW-109B1, MW-109B2, MW-110B1, and MW-110B2) is 1,200 gallons. If any of the newly constructed bedrock wells do not readily accept the lactate injections, and for MW-16B1 and MW-16B2 (which did not readily accept the lactate solution during the pilot study), inject a design volume of 50 gallons of 60% sodium lactate. Bedrock wells to receive injections are subject to change based on the groundwater baseline sampling results.

2.3 OVERBURDEN INJECTION POINT SPACING, NUMBER OF INJECTION POINTS AND INJECTION VOLUME

Injection volumes for the overburden injections are provided in Table 13 30 00-1. The proposed injection point spacing and the injection points are provided on the Contract Drawings. The RA contractor may propose modification to the proposed injection points following review of the groundwater screening and baseline sampling results in the Amendment Injection Work Plan for review and approval.

2.4 INJECTION SYSTEMS

The design of injection systems specified herein is performance based. Provide injection systems that meet the below requirements at a minimum.

- a. Injection system capable of concurrently delivering amendment at a minimum of three injection points simultaneously for lactate injections.
- b. Able to distribute the ZVI with organics amendment slurry at manufacturer recommended consistency.
- c. Able to deliver amendments at pressures ranging from 100 to 250 pounds per square inch (psi) with maximum instantaneous pressure of 400 psi.
- d. Able to deliver lactate solution at flow rates between 6 and 20 gallons per minute (gpm) per location with an average flow rate of 12 gpm over the entire project duration.
- e. Able to deliver the ZVI with organics amendment slurry at flow rates between 5 and 9 gallons per minute (gpm) per location with an average flow rate of 6 gpm over the entire project duration.

- f. Able to monitor injection instantaneous flow rates with a $\pm 5\%$ error, injection pressures with $\pm 10\%$ error and totalizers with a $\pm 2\%$ error.

Provide specifications for amendment stock solution/powder transfer pump/equipment to mixing tanks, mixing tank, mixing equipment to prepare the designed amendment dosage.

Provide specifications for injection hoses, injection point manifold and injection well head assembly to meet the required flow, pressure and chemical compatibility for the project.

All components and equipment for injections must be furnished, when possible, skid-mounted, pre-piped, and pre-wired in trailers ready for hookup. The installation of the system equipment must be in strict accordance with the manufacturer's technical data and printed instructions.

Provide sufficient quantity of tools and spare parts to repair the system. Downtime due to equipment failure should be avoided and the Contractor shall bear the costs associated with downtime due to equipment failure. The Contractor shall provide a list and quantity of tools, spare parts and stand-by equipment for injection system.

Provide up to 2-foot long expandable injection screen. Provide the specifications for the selected screen in the submittal.

Provide sufficient quantity and size of mixing tanks, transfer pumps, mixing equipment, injection screens, drill rods and injection well head assembly to limit injection downtime between designed amendment batch preparation and injecting the amendment solution to target interval to less than 15 minutes.

Provide an injection well head assembly with a quick disconnect fitting for injection hose and at a minimum two ball valves to control flow of amendments into the injection location for relieving injection pressure.

Consider the distance between the injection systems and the injection locations and provide sufficient lengths of hose to make the connections.

Provide up to three amendment injection systems for gravity feed of the solution into the bedrock wells to allow injections to occur simultaneously. Each of the systems must also be equipped with injection pumps to expedite the injection as necessary.

For each gravity feed bedrock injection system, at least one mixing tank must be used to prepare the 30% sodium lactate solution and one mixing tank for 60% sodium lactate solution as necessary. Pumps can be used to transfer water and 60% sodium lactate into a mixing tank to mix and store the injection solution next to the bedrock wells to be injected. Then the injection solution must be fed by gravity or low pressure into the bedrock monitoring wells. Calculate the required low injection pressure to overcome static pressure of the water column in each bedrock well. When low pressure is used, it is not anticipated to be greater than 10 psi over the static pressure or as approved by the Government. Provide pumps if needed for bedrock injection under low pressure.

Design the injection system or process to avoid freezing of injection equipment during winter period.

PART 3 EXECUTION

3.1 GENERAL INFORMATION

Assist and provide relevant information to the Contracting Officer for site access as necessary.

The Contractor must be responsible for securing all their materials and equipment while at the site. The Government is not responsible for any of the Contractor's materials or equipment being vandalized, stolen, or otherwise rendered unsuitable for use on this project.

Protect all existing utility and private property items from damage due to remedial action activities. If damage to public utility or private property occurs, report it to the Contracting Officer immediately. The Contractor is responsible for repairing the damaged item to pre-damaged conditions in a timely manner to the satisfaction of the property owner and the Government.

3.2 INITIAL CALIBRATION AND LEAK TEST

All flow meters must be calibrated to demonstrate that they are within the accuracy specified herein.

The Contractor must demonstrate that the entire system, including all hoses, are clean of contamination.

At each injection location, the Contractor must test the entire injection system, without adding any amendment, and demonstrate that the system operates without any leaks.

3.3 INJECTION OPERATIONS

3.3.1 Overburden Injections

Deliver the ISB amendments to the target treatment zone as discussed below for the overburden injections.

The site is divided into three treatment areas (Areas 1, 2, and 3) as shown on the Contract Drawings. Mark-out the locations of injection points in accordance with the approved Amendment Injection Work Plan.

Complete the mark-out and injections by treatment zone in the following order: 1-1, 1-2, 2-1, 2-2, 3-1 and 3-2.

Propose to implement a top-down or bottom-up approach to deliver the amendments for vertical distribution in the treatment volume for approval by the Contracting Officer in the Amendment Injection Work Plan. A bottom-up approach with a 2-foot injection screen is discussed herein.

As shown on Table 13 30 00-1, deliver 14.3 gallons of sodium lactate amendment solution per cubic yard of treatment volume in zones identified for lactate injection. In zones identified for ZVI with organics injection, the amount of ZVI with organics in the slurry varies based on the required design dosing, as shown on Table 13 30 00-1.

In the Amendment Injection Work Plan, provide the proposed injection process for approval. An example of lactate (only) injection using 14-foot center-to-center grid is provided below.

- a. Advance the DPT rods with an expandable point and a 2-foot screen to the top of weathered bedrock or refusal. Pull up the drive rods 2 feet to expose the screen to the target treatment zone.
- b. Inject a total of 208 gallons of the designed concentration of the amendment solution under pressure at the bottommost 2-foot treatment zone.
- c. After completing the bottommost injection interval, pull up the injection screen 2.5 feet and inject into the next interval. This results in a 0.5-foot depth between two vertically adjacent injection intervals. The injection volume for subsequent injections into the remaining shallower depth intervals must include the injection volume for the 0.5-foot depth zone between the two vertically adjacent injection intervals. Deliver 260 gallons of designed concentration of the amendment solution for the subsequent 2.5-foot intervals.
- d. Continue to inject the required volume of amendment in the target treatment zones and pull up the screens as the volume for specific treatment zone is completed until the top of the injection screen is at the top of the water table.

Maintain, at a minimum, a spacing of 50 feet between active injection points to minimize potential impacts from adjacent injection points.

In case daylighting is observed, stop the injections at the location(s) identified to be causing the daylighting. The Contractor must attempt to deliver the amendments at lower injection pressure or abandon the injection location. If the location is abandoned, the injection point must be relocated within 3 feet of the original injection point and injection of the designed volume of amendment must be attempted. Injection at a relocated point must be performed a minimum of 24 hours after abandonment of the original injection location. In the event the location continues to daylight after a maximum of five attempts per location, including the original location, the Contractor must equally distribute the remaining volume of amendment in the surrounding injection locations.

Upon completion of injections at each injection location, the drill rods and injection screen must be pulled and the borehole must be tremie grouted from bottom up in accordance with NJDEP regulations and SECTION 02 32 13 - SUBSURFACE DRILLING AND SAMPLING.

3.3.2 Bedrock Injections

Deliver the ISB amendments into the eleven bedrock wells identified for injections either gravity feed or pumping under a low pressure injection method.

For the gravity feed injection method, record the volume of amendments in the tank feeding the injection well at the start and end of each injection day.

During amendment injection at MW-6B1, calibrate and deploy a water level transducer in each of the four newly installed bedrock well clusters (MW-109B1 and B2 and MW-110B1 and B2) prior to injection, check the water levels in those four bedrock monitoring wells periodically, at a minimum of twice per day. The water level traducers must be left in the wells for one day after the completion of injection at MW-6B1. Download the data

from the transducer and submit the data to the Contracting Officer for review.

3.4 DOCUMENTATION

Record the following information during the injection process for each injection location.

- a. Date, start time, end time, flow rates, volume delivered and injection pressure for each depth interval.
- b. Document any unplanned events like injection or groundwater daylighting, sudden increase or decrease in injection pressure.
- c. Submit the injection record in daily quality control reports at the end of each day of field operation.

-- End of Section --

Table 13 30 00 - 1
Treatment Volume and Amendment Calculations
White Chemical Corporation Superfund Site, OU3

Contamination Range	Amendment Type	Amendment Dosage		Treatment Volume	Amendment Quantity		Injection Volume	
		Lactate	ZVI with Organics		Lactate	ZVI with Organics	Lactate	ZVI with Organics
(µg/L)		lbs/cyd	lbs/cyd	(cyd)	(lbs)	(lbs)	(gal)	(gal)
100 – 1,000	Lactate	3.25	-	92,100	299,325	-	1,317,030	-
1,000 – 10,000	ZVI with organics amendment	-	13.00	80,900	-	1,051,700	-	475,368
10,000 – 20,000	ZVI with organics amendment	-	16.00	1,900	-	30,400	-	13,741
Total				174,900	299,325	1,082,100	1,317,030	489,109

Notes:

1. The concentration ranges presented in this table are based on the updated Leapfrog model incorporating the 2021 data; concentrations are to be confirmed during GW profile sampling to be performed by the RA Contractor during the RA. The RA Contractor must update the quantity of treatment volume for each concentration range based on results from the groundwater profile sampling and baseline groundwater sampling from monitoring wells and submit this update to the USACE for review and approval. USACE will not be providing any additional injection figures or drawings to, or do any additional data analysis for, the RA contractor after award and after the baseline sampling results are received.

2. Inject ZVI with organics in a slurry mixture consisting of 30% ZVI with organics. A 30% ZVI with organics slurry consists of a mixture of 50 pounds of ZVI with organics and 14 gallons of water. Based on a density of 0.7 g/cm³ for the ZVI with organics, the volume of 50 lbs of ZVI with organics amendment is 8.6 gallons. Therefore, for a 30% slurry using one bag of ZVI with organics amendment, the amendment solution will be 22.6 gallons.

3. To achieve the target radius of influence, sodium lactate must be mixed with 14 gallons of water. Inject a mixture of 14 gallons of water and 3.25 lbs of 100% sodium lactate (which is 0.3 gallons of sodium lactate) for every cubic yard of soil in the treatment zone. Density of 100% sodium lactate is approximately 11 lbs/gallon; therefore, a total of 299,325 lbs of 100% sodium lactate at 60% sodium lactate (assumed product percentage to be purchased) is approximately 45,300 gallons. The total amount of 60% sodium lactate needed for two rounds of injection is 90,600 gallons.

µg/L - micrograms per liter

cyd - cubic yard

gal - gallon

lbs - pounds

SECTION 32 00 00

SITE RESTORATION

PART 1 GENERAL

1.1 SCOPE OF WORK

Furnish all labor, equipment, material, and incidentals necessary to restore the site as specified herein, as shown on the Contract Drawings, and/or as directed by the Contracting Officer. Site restoration activities include restoration of the White Chemical Corporation (WCC) property and the 646 Frelinghuysen Avenue property as discussed herein.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.1 STAGING AREA

Materials and facilities associated with the staging area must be in accordance with SECTION 01 50 00 - TEMPORARY CONSTRUCTION FACILITIES AND UTILITIES and must be removed at the end of remedial activities.

3.2 GROUND RESTORATION

Regrade the coarse stone on the WCC property to a smooth, continuous surface and restore the asphalt on the driveway leading to the property at the end of remedial construction.

3.3 PAVEMENT AND DRIVEWAY AREA

Restore the paved area and driveway area on the 646 Frelinghuysen Avenue property to asphalt at the end of remedial construction. Asphalt paving must be in accordance with SECTION 32 01 13 - ASPHALTIC PAVING.

3.4 REMOVAL OF EQUIPMENT AND MATERIALS

Remove all equipment and materials used during the project operation at the WCC property area and at 646 Frelinghuysen Avenue including, but not limited to, temporary construction facilities staging area, temporary fencing, electrical wiring, decontamination pad, etc., prior to demobilization from the site.

All materials removed during the site restoration activities must be disposed of at an approved off-site disposal facility by the Contractor.

Prior to demobilization, all equipment must be decontaminated in accordance to SECTION 01 35 29 - HEALTH, SAFETY, AND EMERGENCY RESPONSE PROCEDURES.

3.5 TEMPORARY FACILITIES AND UTILITIES

Remove all temporary facilities and associated utilities from the site within 30 days of completion of the project or as directed by the Contracting Officer.

Coordinate with the appropriate utility owners to disconnect the temporary internet cable and electrical service, and remove all associated aboveground wires.

3.6 RESTORATION

Existing facilities that have been damaged during remedial activities must be restored to original conditions.

3.7 CLEANUP

Remove excess and waste materials from the site and disposed of it offsite in accordance with SECTION 02 81 00 - TRANSPORTATION AND DISPOSAL WASTE OF MATERIAL.

3.8 DEMOBILIZATION

Vacate the site in an orderly manner and to the satisfaction of the Contracting Officer.

-- End of Section --

SECTION 32 01 13

ASPHALTIC PAVING

PART 1 GENERAL

1.1 SUMMARY

Furnish all labor, supervision, materials equipment, and incidentals necessary to mill existing pavement and install a 2-inch layer of asphalt where necessary and as specified herein

Restore damaged pavement at the entrance to the White Chemical Corporation (WCC) property and on the 646 Frelinghuysen Avenue property.

1.2 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only. Where reference is made to one of these standards, the revision in effect at the time of contract award apply.

ASTM INTERNATIONAL (ASTM)

ASTM D2027 Standard Specification for Cutback Asphalt
(Medium-Curing Type)

ASTM D2216 Standard Test Methods for Laboratory
Determination of Water (Moisture) Content
of Soil and Rock by Mass

NEW JERSEY DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS
(NJDOTSS)

Section 401 Hot Mix Asphalt (HMA) Courses

Section 901 Aggregates

Section 903 Concrete

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals with an "FIO" designation are for information only. Submit the following to the Contracting Officer in accordance with SECTION 01 33 00 - SUBMITTAL PROCEDURES.

SD-03 Product Data

Mix Designs; G

Submit all necessary Job-Mix Formula and mix design at least 14 days before it is to be used.

PART 2 PRODUCTS

2.1 AGGREGATE

Coarse and fine aggregate for bituminous concrete must conform to [Section 901](#) of the NJDOTSS.

2.2 BITUMINOUS CONCRETE

The bituminous concrete mix for the base course and surface course must be, at a minimum, in accordance with NJDOTSS [Section 903](#).

The bituminous concrete stabilized base course mix must be hot mix asphalt (HMA) 25M64, in accordance with the requirements of [Section 401](#) and [Section 903](#) of the NJDOTSS.

The pavement surface course mix must be HMA 12.5H76, in accordance with the requirements of [Section 401](#) and [Section 903](#) of NJDOTSS.

2.3 BITUMINOUS MATERIALS

2.3.1 Prime Coat

The bituminous prime coat must be medium-curing cut back asphalt conforming to [ASTM D2027](#), designation MC-70 or an emulsified asphalt, designation RS-1.

2.3.2 Tack Coat

The bituminous tack coat course must not be installed in this Contract.

PART 3 EXECUTION

3.1 WEATHER LIMITATIONS

Bituminous prime coat must be applied only when the ambient temperature in the shade is above 50 degrees Fahrenheit (F) or when the temperature has not been below 35 degrees F for 12 hours immediately prior to application. Application may commence when the aggregate base course is dry or contains moisture not in excess of the amount that will permit uniform distribution and the required penetration.

The bituminous mixture must not be placed upon a wet surface, in rain, or when the surface temperature of the underlying course is less than 50 degrees F. The temperature requirements may be waived by the Government. Once the bituminous mixture has been placed and if rain is imminent, protective materials, consisting of rolled polyethylene sheeting at least four mils thick of sufficient length and width to cover the mixture must be placed.

3.2 PREPARATION OF MIXTURES

Feed rates of aggregates must be regulated so that moisture content and temperature of aggregates will be within tolerances specified. Aggregates and bituminous must be conveyed into the mixer in proportionate quantities required to meet NJDOTSS requirements. Mixing time must be as required to obtain a uniform coating of the aggregate with the bituminous material. Temperature of the bituminous material at time of mixing must not exceed 275 degrees F. Temperature of aggregate in the mixer must not exceed 300

degrees F when bituminous material is added. Overheated and carbonized mixtures or mixtures that foam must not be used.

3.3 WATER CONTENT OF AGGREGATES

Drying operations must reduce the water content of mixture to less than 0.75 percent. Water content must be determined in accordance with ASTM D2216 and weight of sample must be at least 1.1 pounds. The water must be reported as a percentage of the total mixture.

3.4 STORAGE OF MIXTURE

The open graded bituminous mixture must not be stored for longer than one hour prior to hauling to the site.

3.5 TRANSPORTATION OF MIXTURE

Transportation from the mixing plant to the site must be in trucks having tight, clean, smooth beds lightly coated with an approved releasing agent to prevent adhesion of mixture to truck bodies. Diesel fuel must not be used as a releasing agent. Excessive release agent must be drained prior to loading. Each load must be covered with canvas or other approved material of ample size to protect mixture from the weather and to prevent loss of heat. In cool weather or for long hauls, the entire contact area of each truck bed must be insulated. Covers must be securely fastened. Loads that have crusts of cold, unworkable material or have become wet will be rejected. Hauling over freshly placed material will not be permitted.

3.6 SURFACE PREPARATION OF UNDERLYING COURSE

Prior to placing open graded bituminous mixture, the underlying course must be cleaned of all foreign or objectionable matter with power brooms and hand brooms. Ruts or soft, yielding spots in the subgrade must be loosened and removed and approved materials must be backfilled, reshaped and compacted to meet the final grade requirements. At the time of base course construction, the sub-grade or sub-base course must contain no frozen material.

3.7 PRIME COATING

Contact surfaces of existing soil aggregate or dense graded aggregate sub-base courses must be sprayed with a prime coat. The rate of application must be 0.15 to 0.35 gallons per square yard of surface.

Excess prime-coat material must be squeegeed from the surface. Areas missed by the bituminous prime coat distributor must be treated with prime coat material by means of hand sprayers.

Following the application of prime coat material, the surface must be allowed to dry without being disturbed for a period of not less than 48 hours or longer as may be necessary. Blotting the prime coat with fine aggregate will not be permitted.

3.8 PLACING OPEN GRADED BITUMINOUS MIXTURE

3.8.1 Pavers

The mix must be placed at a temperature of not less than 200 degrees F.

Upon arrival, the mixture must be spread to full width (minimum 10 feet) by and approved bituminous paver. It must be struck off in a uniform layer of such depth that, when the work is completed, it must have the required thickness of the adjacent pavement. The speed of the paver must be regulated to eliminate pulling and tearing of the bituminous mat. Unless otherwise directed, placement of the mixture must begin along the center line of a crowned pavement or along the highest side of a sloped cross-section. The mixture must be placed in consecutive adjacent strips.

On areas where irregularities or unavoidable obstacles make the use of mechanical spreading and finishing equipment impractical, the mixture may be spread, raked and luted by heated hand tools.

3.8.2 Rollers

3.8.2.1 General

Use small (three-ton maximum) tandem steel wheel vibratory rollers to smooth over the surface of freshly placed open graded bituminous mixture. Rolling must be extended to overlap the preceding strips. The vibratory unit must be turned off during smoothing of the bituminous mixture. Rollers must be in good condition, capable of operating at slow speeds to avoid displacement of the bituminous mixture. During rolling, the wheels must be kept moist with the minimum amount of water required to avoid picking up the bituminous-concrete mixture in places not accessible to the rollers, the mixture must be compacted with hot hand tampers. The number, type and weight of rollers must be sufficient to roll the mixture to the voids total mix requirement of 25 to 35 percent while it is still in a workable condition. The use of equipment that causes excessive crushing of the aggregate will not be permitted.

3.8.2.2 Initial Rolling

The initial rolling must immediately follow the rolling of the longitudinal joint and edges. Rollers must be operated as close to the paver as possible without causing undue displacement.

3.8.2.3 Second Rolling

The second rolling must follow the initial rolling as closely as possible, while the mixture is hot and in condition suitable for proper compaction.

Rolling must be continuous (at least three complete coverages) after the initial rolling until the mixture has been compacted.

The open graded bituminous mixture must be smoothed with one to three passes of the prescribed roller without vibration. The temperature of the freshly placed open graded bituminous mixture must be low enough to prevent excessive shoving or cutting of the mat under the roller.

3.9 JOINTS

Joints must have the same texture, density and smoothness as other sections of the course. Joints between old and new pavements, or between successive days work, must be made to ensure a continuous bond between the old and new section of pavement. Traverse joints must be offset at least 24 inches and longitudinal joints must be offset at least six inches. The edge of the previously placed course must be cut back to expose an even vertical surface over the full thickness of the course.

3.10 PATCHING DEFICIENT AREAS

Bituminous-concrete mixtures that become mixed with foreign material or that are defective, such as low areas or "bird-baths", must be removed, replaced with fresh bituminous-concrete mixture to obtain the required grade and smoothness for the finished surface and compacted to the specified density.

Pavement in deficient areas must be removed to the full thickness of the bituminous concrete course and saw cut that the sides are perpendicular and parallel to the direction of traffic and the edges are vertical. Edges must be sprayed with bituminous tack-coat material.

Skin patching an area that has been rolled will not be permitted.

3.11 PROTECTION OF PAVEMENT

After final rolling, vehicular traffic must not be permitted on the pavement until the pavement has cooled and hardened and in no case sooner than six hours.

3.12 ACCEPTABILITY OF WORK

3.12.1 General

Routine testing for acceptability of work must be performed by the Contractor and approved by the Contracting Officer. Additional tests required to determine acceptability of non-conforming material must be performed by the Contractor. When a section of pavement fails to meet the specification requirements, that section must be totally removed and replaced. The Government reserves the right to sample and test any area that appears to deviate from the specification requirements.

3.12.2 Thickness and Surface-Smoothness Requirements

Finished surface of asphalt paving, when tested as specified below, must conform to the thickness specified and to surface smoothness requirements. The surface smoothness must be within a 1/4-inch tolerance in the longitudinal and transverse direction.

3.12.2.1 Thickness

The measured thickness of the asphalt pavement must not exceed the adjacent pavement by more than 1/2-inch. The final surface must have a uniform texture and must conform to the required grade and cross section. Low or defective areas must be immediately corrected by cutting out the faulty areas and replacing them.

3.12.2.2 Surface Smoothness

Finished surfaces must not deviate from testing edge of a 12-foot straightedge more than the tolerances defined herein.

-- End of Section --

SECTION 33 51 39

MONITORING WELLS

PART 1 GENERAL

1.1 SCOPE OF WORK

Furnish all labor, materials, equipment and incidentals required to complete installation and development of overburden and bedrock monitoring wells as shown on the Contract Drawings and as specified herein. This section is intended to give a general description of what is required but does not cover all variations that may occur during well construction. This section is intended to cover the successful completion of the scope as specified herein, whether every detail is specifically mentioned or not. A summary of wells to be installed and their construction details are provided in the Contract Drawings. This specification includes the following monitoring well installation activities:

- a. Complete a monitoring well condition assessment and provide well repair or abandonment recommendations to the Contracting Officer.
- b. Mobilize a rotary sonic drilling rig for overburden well installation. For bedrock well installation, mobilize one air-rotary rig for well installation; a pump rig for FLUTe™ liner installation, packer testing and well development; and a support vehicle for downhole geophysical testing. Provide additional rigs and equipment as necessary for development of the wells in a timely manner and in order to meet the construction schedule.
- c. Construct and develop overburden wells as shown on the Contract Drawings on the WCC property and 646 Frelinghuysen Avenue.
- d. Bedrock monitoring well activities
 - (1) Advance 4 bedrock boreholes as shown on the Contract Drawings.
 - (2) Perform downhole geophysical testing and packer testing of 2 deep bedrock boreholes.
 - (3) Install a bedrock monitoring well in each bedrock borehole with screen depth to be determined by the borehole testing and develop each well.

A summary of the overburden wells and bedrock wells to be installed and their construction details are provided on the Contract Drawings.

Overburden monitoring well screen intervals and locations will be finalized based on the results of the groundwater screening sampling to be performed in accordance with SECTION 02 32 13 - SUBSURFACE DRILLING AND SAMPLING. Vertical depth of the bedrock wells will be finalized based on the results of the downhole geophysics and the borehole packer testing.

Perform all well drilling and construction activities in accordance with this specification and N.J.A.C. 7:9D.

Obtain well permits from the New Jersey Department of Environmental

Protection (NJDEP) for each new well installation.

Contact the New Jersey "One Call" system and make any other requests necessary for utility mark-outs at all well drilling locations.

Dispose of all investigation-derived waste (IDW) offsite in accordance with SECTION 02 81 00 - TRANSPORTATION AND DISPOSAL OF WASTE MATERIAL. This includes drill cuttings and aqueous waste including all decontamination wash water, drilling water, and development water.

1.2 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only. Where reference is made to one of these standards, the revision in effect at the time of contract award applies.

ASTM INTERNATIONAL (ASTM)

ASTM A589/A589M-06	Standard Specification for Seamless and Welded Carbon Steel Water-Well Pipe
ASTM A778/A778M	(2022) Standard Specification for Welded, Unannealed Austenitic Stainless Steel Tubular Products
ASTM C136	Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates
ASTM C150-07	Standard Specification for Portland Cement
ASTM D1784	Standard Specification for Rigid Poly (Vinyl Chloride) (PVC) Compounds and Chlorinated Poly (Vinyl Chloride) (CPVC) Compounds
ASTM D1785	Standard Specification for Poly (Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80, and 120.
ASTM D2488	Standard Practice for Description and Identification of Soils (Visual-Manual Procedure)
ASTM D4630-19	Standard Test Method for Determining Transmissivity and Storage Coefficient of Low-Permeability Rocks by In Situ Measurements Using the Constant Head Injection Test
ASTM D5088	Decontamination of Field Equipment Used at Nonradioactive Waste Sites
ASTM D5092	Design and Installation of Ground Water Monitoring Wells in Aquifers
ASTM D5521	Guide for Development of Groundwater Monitoring Wells in Granular Aquifers

ASTM D5753-18	Standard Guide for Planning and Conducting Borehole Geophysical Logging
ASTM D5782	Standard Guide for Use of Direct Air-Rotary Drilling for Geoenvironmental Exploration and the Installation of Subsurface Water-Quality Monitoring Devices
ASTM D6914/D6914M-16	Standard Practice for Sonic Drilling for Site Characterization and the Installation of Subsurface Water Quality Monitoring Devices
AMERICAN WATER WORKS ASSOCIATION (AWWA)	
AWWA A100	Water Wells
New Jersey Administrative Code (N.J.A.C.)	
N.J.A.C. 7:9D	Well Construction and Maintenance; Sealing of Abandoned Wells
U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)	
49 CFR 172	Hazardous Materials Table, Special Provisions, Hazardous Materials Communications, Emergency Response Information, and Training Requirements

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals with an "FIO" designation are for information only. Submit the following to the Contracting Officer in accordance with SECTION 01 33 00 - SUBMITTAL PROCEDURES.

SD-01 Preconstruction Submittals

Well Condition Assessment and Repair Plan; G

Submit the Well Condition Assessment and Repair Plan at least 14 days prior to Pre-Construction conference. It should include (but not be limited to) the following:

- General conditions of each existing groundwater monitoring well on both properties.
- Determination of which wells require maintenance and repair, extension, or abandonment.
- Proposed maintenance and repair, extension, or abandonment approaches for the applicable wells.

Drilling Methods; G

Describe the drilling method(s) for completion of the monitoring wells, including the method used to advance both the outer casing borehole and primary borehole, any drilling fluid utilized, borehole diameters, drill bit sizes, the methods for containing drilling

fluids, and the estimated amount of investigation-derived waste expected to be generated.

Drilling Work Plan; G

Within 30 days prior to Pre-Work Conference, dependent upon approval from the Government, submit for review and comment a drilling work plan in accordance with Paragraph 3.10.

Decontamination Pad Design; G

Provide a design showing the size, layout, construction, and materials which will be used to construct the decontamination pad at the site staging area. The pad must be of sufficient size to accommodate the drill rig and to contain all water and splashing generated during decontamination. Design the pad so that water collects in one corner where it can be pumped to the temporary water treatment system for treatment prior to disposal.

SD-03 Product Data

Catalog Data; FIO

Provide a list of products proposed for use, together with manufacturer's published description information on the item, for the following items:

- a. Well casing, including copy of manufacturer's certification that material being supplied meets specified requirements in accordance with [ASTM D1784](#) and [ASTM D1785](#)
- b. Well screen, including copy of manufacturer's certification that material being supplied meets specified requirements
- c. Filter pack, including manufacturer's grain size analysis, Sieve analyses to be performed in accordance with [ASTM C136](#).
- d. Sand seal, including manufacturer's grain size analysis, Sieve analyses to be performed in accordance with [ASTM C136](#).
- e. Type II Portland Cement in accordance with [ASTM C150-07](#)
- f. Bentonite (for grout)
- g. Protective Casings and caps to be used

Drilling Logs; G

Provide drilling logs as described in Paragraph 1.8.2 - Drilling Logs.

Well Installation Reports; FIO

Provide well installation reports as described in Paragraph 1.8.3 - Well Construction Diagrams.

Field Notebooks; G

Provide field notebooks as described in Paragraph 1.8.5 - Field Notebooks.

SD-05 Design Data

Daily Driller's Report; G

During drilling of each well, maintain and submit a daily driller's report. The report must give the number of feet drilled, the number of crew-hours on site, any shutdown due to breakdown, the feet of casing set and other pertinent data if requested by the Contracting Officer.

SD-06 Test Reports

Groundwater Packer Sampling Data Submittal; G

Submit preliminary VOC data in a spreadsheet within 48 hours after its collection. At the same time, also compile and submit the groundwater sampling purging measurements, such as pH, conductivity, DO, ORP in a spreadsheet.

Downhole geophysical logging reports; G

Submit downhole geophysical logging reports within 48 hours after downhole geophysical testing completion in accordance with Paragraph 3.5.4.

SD-07 Certificates

Well Development Records; G

Provide well development records as described in Paragraph 1.8.4 - Well Development Records.

Drilling Permits And Licenses; G

Provide copies of all permits, licenses, or other certificates necessary for execution of the work.

NJDEP Well Permits and Well Records; FIO

Qualifications; FIO

Provide qualifications document in accordance with Paragraph 1.4 - QUALIFICATIONS.

Drilling Rig Inspection; FIO

Supply rig inspection certificates prior to the start of onsite activities. The certificates must indicate that the rigs are in acceptable working order and are capable of performing the work identified in this specification.

Utility Clearance Record; FIO

Prepare results of the geophysical survey and utility clearance records in accordance with Paragraph 3.1 - PROTECTION OF EXISTING CONDITIONS AND UNDERGROUND UTILITIES and submit to the Contracting Officer prior to the start of drilling. Update utility clearance as necessary so that no drilling is performed after the utility clearance period has expired.

1.4 QUALIFICATIONS

All well drilling, installation and decommissioning must be performed by a State of New Jersey-licensed well driller. The driller's license must be appropriate to the type of well to be installed or decommissioned, in accordance with N.J.A.C. 7:9D-1.7. Only employ a driller competent to perform the work with a minimum of five years installing wells similar to those at this site.

The well driller must be capable of identifying geologic formations.

All personnel must have completed OSHA-required 40-hour training for work on hazardous waste sites, 8-hour refresher training as appropriate, and must be participating in OSHA-required medical monitoring program for work on hazardous waste sites.

Provide the following information for the downhole geophysical logging subcontractor: qualifications, years of experience, and project information and references for similar projects.

1.5 REGULATORY REQUIREMENTS

1.5.1 Permits and Licenses

Obtain local, state, or federal permits or licenses required to perform the work included in this contract prior to commencing drilling and well installation operations.

1.5.2 Statutes and Regulations

Conduct work required by this specification in strict compliance with applicable local, state, and federal regulations, statutes, and codes. Compliance is the responsibility of the Contractor.

N.J.A.C. 7:9D requires the outer protective casing for a bedrock well to be installed ten feet into bedrock. However, since the outer protective casing for site bedrock wells, as described in Paragraph 3.5.2 and as shown on the Contract Drawings, is proposed to be installed 5 feet into bedrock, the Contractor may be required to acquire a variance as directed by the Contracting Officer.

1.6 DELIVERY, STORAGE, AND HANDLING

Properly protect all parts and materials to be incorporated in the work so that no damage, deterioration, or contamination occurs from time of shipment until installation is completed.

If, in the opinion of the Government, parts and materials are damaged, deteriorated, or contaminated before acceptance of the wells, the material will be rejected. Replace these parts and materials.

Store materials, supplies, and equipment at an onsite location, or locations, as approved by the Contracting Officer.

1.7 SITE CONDITIONS, PROTECTION OF EXISTING FACILITIES, AND ENVIRONMENTAL PROTECTION

Physical access to each well site, including any utility clearance, is the

responsibility of the Contractor. Visit each work location to observe any condition that may hamper transporting equipment or personnel to the well site. If clearing or relocation is necessary, the Contractor and the Contracting Officer must agree on a suitable clearing or relocation plan, and the location of any required access road.

Protect all surface and subsurface structures and surrounding areas from damage that may result from the methods employed in performing the work. The Contractor is responsible for any damages resulting from his operations. Repair or replace damage to property to the existing condition. The Contracting Officer has the right to approve these restoration measures. Complete monitoring well installation prior to final grading and ground cover restoration.

Take all precautions as may be required to prevent contaminated water or water having undesirable physical or chemical characteristics from entering the water supply through the well bore or by seepage from the ground surface. Also take all precautions necessary to prevent contamination of the ground surface or surface waters resulting from drilling of the test borehole or well.

1.8 DOCUMENTATION AND QUALITY CONTROL REPORTS

1.8.1 Well Installation Documentation

Establish and maintain documentation and quality control reports to record the desired information for well construction (Paragraph 1.8.3) and well development (Paragraph 1.8.4) and to assure compliance with contract requirements. Complete all forms required by the State of New Jersey for installation of wells including New Jersey well permits and well records and return the forms to the appropriate agency. Also provide a copy to the Contracting Officer.

1.8.2 Drilling Logs

A drilling (boring) log must be completed for each boring drilled. A qualified geologist or engineer present must prepare drilling logs during all well drilling and installation activities. Keep current copies of completed logs in the field at each well site and available at all times for inspection by the Contracting Officer. Information provided on the logs must include, but not be limited to, the following:

- a. Name of the project and site.
- b. Boring/well identification number.
- c. Location of boring (coordinates, if available)
- d. Make and manufacturer's model designation of drill rig and name of drilling firm.
- e. Date drilling started and ended.
- f. Reference point for all depth measurements.
- g. Name of driller and name and signature of geologist or engineer preparing log.
- h. Nominal borehole diameter and depth at which borehole diameter changes.

- i. Total depth of boring.
- j. Method of drilling, including information such as rod size, bit size and type, pump type, etc. Also include a description of any temporary casing used, drill fluids, and fluid additives used, if any, including brand name and amount used. If used, record mud viscosities and weight.
- k. Depth of each change of stratum. If location of strata change is approximate, it must be so stated.
- l. Description of the material (lithology) of which each stratum is composed, in accordance with [ASTM D2488](#) Standard Practice for Description and Identification of Soils (Visual-Manual Procedures), based on visual examination of drill cuttings. Soil parameters for logging must include, but are not limited to, classification, depositional environment and formation, if known, Unified Soil Classification Symbol, secondary components and estimated percentages, Munsell color, plasticity, consistency (cohesive soil), density (non-cohesive soil), moisture content, and grain angularity. Classification must be prepared in the field at the time of sampling. The results of visual observation of the material encountered, and any unusual odor detected must also be noted and recorded.
- m. When applicable, record depth to water and date measured before, during, and after each drilling shift, and prior to well installation. Provide and maintain at each well under construction a portable water-measuring device of sufficient length to measure the water level to 100 feet below ground surface. The device must be available at all times and measuring tape must be graduated in 0.01 foot. Water level measurements must be taken to the nearest 0.01-foot.
- n. When applicable, water productivity based on observed production during advancement of the borehole.

1.8.3 Well Construction Diagrams

The well must not be accepted before the geologic logs and installation diagrams are received and reviewed. The diagram must illustrate the as-built condition of the well and include, but not be limited to, the following items:

- a. Name of the project and site.
- b. Copies of any NJDEP Well Permits, Well Records, and Well Decommissioning (Abandonment) Records.
- c. Name of driller and name and signature of the geologist preparing diagram.
- d. Date well installation started and ended.
- e. Description of material from which the well is constructed, including well casing/riser pipe and screen material; diameter and type of casing and screen; screen slot size; gradation of filter pack; lithologic description; brand name (if any), source, processing method, and method of placement of the filter pack; and type of protective cover.

- f. Total depth of well, measured from the top of inner casing of the completed well.
- g. Nominal drilled hole diameter.
- h. Type of cement and/or bentonite used, mix ratios of grout, method of placement and quantities used.
- i. Elevations, depths, and heights of key features of the well, such as top of casing or riser pipe, top and bottom of protective casing, ground surface, bottom of well screen, top and bottom of filter pack, and top and bottom of seal. Surveying work must be as specified in Paragraph 3.2.1 - Surveying of this specification and SECTION 01 71 23 - SURVEYING.
- j. Other pertinent construction details, such as slot size and percent open area of screen, type of screen, length of screen, and manufacturer of screen.
- k. Well location by coordinates. A plan sheet must also be included showing the coordinate system used and the location of each well. A plan sheet is not required for each well installation diagram; multiple wells may be shown on the same sheet.
- l. Static water level upon completion of the well.
- m. Special problems and their resolutions, e.g., grout in wells, lost casing, or screens, bridging, etc.
- n. Description of surface completion.
- o. The depth or location of any lost drilling fluid, drilling materials, or tools.
- o. Any other pertinent data requested by the Contracting Officer.

1.8.4 Well Development Records

Prepare well development records for all monitoring wells. Information provided on the well development record must include, but not be limited to, the following:

- a. Date, time, and elevation of water level in the well, before development.
- b. Depth to bottom of well, name of project and site, well identification number, and date of development.
- c. Method used for development, to include size, type and make of equipment, bailer, and/or pump used during development.
- d. Time spent developing the well by each method, to include typical pumping rate, if pump is used in development.
- e. Volume and physical character of water removed, to include changes during development in clarity, color, particulates, and odor.
- f. Volume and source of water added to the well, if any.

- g. Volume and physical character of sediment removed, to include changes during development in color, and odor.
- h. Source of any water added to the well.
- i. Turbidity of water before, during, and after development. Report turbidity observations in Nephelometric Turbidity Units (NTU).
- j. Total depth of well and the static water level from top of the casing immediately after pumping/development.
- k. Readings of pH, specific conductance, and temperature must be taken before, during, and after development. Continue well development until pH, specific conductance, and temperature have stabilized (as described in Paragraphs 3.10 - Well Development) and the turbidity of the water is 50 NTU or less.
- l. Name and qualifications of individual developing well.
- m. Name and/or description of the disposal facility/area, for the waters removed during development.
- n. Initial and final specific capacity of the well as pumping rate in gallons per minute divided by drawdown in feet.
- o. Pumping rates with the associated drawdown measurements.

1.8.5 Field Notebooks

The qualified representative present must keep a field notebook. The notebook must have pre-numbered pages, be permanently bound, and have a waterproof cover. Information must include, but not be limited to, the following:

- a. Date and personnel present
- b. Visitors to the site
- c. Activities performed
- d. Quantities of materials used
- e. Any chemical sampling information
- f. Weather conditions
- g. Any problems encountered and their resolution
- h. Any change in procedure, process, and the material use

PART 2 PRODUCTS

2.1 PRODUCTS SPECIFICALLY FOR OVERBURDEN WELLS

2.1.1 Manhole

Steel casing must be new, nominal 8-inch diameter that complies with the latest revisions of applicable AWWA, API, and [ASTM A589/A589M-06](#) standards.

Minimum steel casing wall thickness must be 0.322 inch.

2.1.2 Monitoring Well Casing

Monitoring well casing must be new, nominal 2-inch diameter, schedule 40, flush-threaded polyvinyl chloride (PVC) pipe that complies with the latest revisions of applicable AWWA standards, [ASTM D1784](#), and [ASTM D1785](#). Fluoropolymer tape (i.e., Teflon tape) must not be used on any joints or pipe threads.

Monitoring well casing must be factory decontaminated and packaged and must remain in its packaging until immediately before installation.

Provide well casing in 5-ft and/or 10-ft lengths. Provide each monitoring well casing with an expandable rubber seal-locking cap.

2.1.3 Well Screen

Monitoring well screen must be new, nominal 2-inch inner diameter, 0.010 slot, schedule 40, PVC screen.

Well screen must be flush joint threaded with O-rings. Monitoring well screen must be provided with 0.010-inch slot size. Well screen must be factory decontaminated and packaged; and must remain in its packaging until immediately before installation.

Provide monitoring well screen in 5-ft and/or 10-ft lengths.

Provide each well screen with a flush-threaded bottom cap of like material.

2.1.4 Filter Pack

Filter pack material must consist of clean, washed, rounded to sub-rounded siliceous material free from calcareous grains or material.

Filter pack gradation must be Filpro #1 filter sand or approved equivalent. Sieve analyses must be performed in accordance with [ASTM C136](#).

2.2 PRODUCTS SPECIFICALLY FOR BEDROCK WELLS

2.2.1 Manhole

Steel casing must be new, nominal 12-inch diameter that complies with the latest revisions of applicable AWWA, API, and [ASTM A589/A589M-06](#) standards.

Minimum steel casing wall thickness must be 0.322 inch.

2.2.2 Protective Outer Casing

Protective outer casing must be new, nominal 6-inch diameter, carbon steel, flush-threaded and comply with the latest revisions of applicable AWWA, API, and [ASTM A589/A589M-06](#) standards.

Protective outer casing must be factory decontaminated and packaged and must remain in its packaging until immediately before installation.

Provide protective outer casing in 5-ft and/or 10-ft lengths.

2.2.3 Monitoring Well Casing

Monitoring well casing must be new, nominal 2-inch diameter, stainless steel, flush-threaded and comply with the latest revisions of applicable AWWA, API, and [ASTM A778/A778M](#) standards.

Monitoring well casing must be factory decontaminated and packaged and must remain in its packaging until immediately before installation.

Provide well casing in 5-ft and/or 10-ft lengths. Provide each monitoring well casing with an expandable rubber seal-locking cap.

2.2.4 Well Screen

Monitoring well screen must be new, nominal 2-inch diameter, stainless steel, wire-wrapped screen.

Well screen must be flush joint threaded, with O-rings. Monitoring well screen must have 0.030-inch slot size. Well screen must be factory decontaminated and packaged, and must remain in its packaging until immediately before installation.

Provide monitoring well screen in 5-ft and/or 10-ft lengths.

Provide each well screen with a flush-threaded bottom cap of like material.

2.2.5 Filter Pack

Filter pack material must consist of clean, washed, rounded to sub-rounded siliceous material free from calcareous grains or material.

Filter pack gradation must be Filpro #2 filter sand or approved equivalent. Sieve analyses must be performed in accordance with [ASTM C136](#).

2.3 SAND SEAL

Sand seal material must consist of clean, washed, rounded to sub-rounded siliceous material free from calcareous grains or material.

Sand seal gradation must be Filpro #00 filter sand or approved equivalent. Sieve analyses must be performed in accordance with [ASTM C136](#).

2.4 CEMENT/BENTONITE GROUT

Seal the borehole annulus above the sand seal to the depth of the bottom of the protective casing (see Paragraphs 3.8 and 3.9) with cement/bentonite grout. Mix the grout to the following proportion specified in [N.J.A.C. 7:9D-2.9](#):

- a. 8.3 gallons potable water
- b. 94 pounds Type II Portland Cement ([ASTM C150-07](#))
- c. 5.0 pounds sodium-based bentonite

2.5 LUBRICANTS

Tool joint lubricants used during drilling operations must contain no petroleum products.

2.6 WATER

Water used for drilling and equipment decontamination purposes must be city water sourced from the hydrant near the entrance of the site as shown on the Contract Drawings.

Provide all water used in the drilling operation. Transport and storage of all water is the responsibility of the Contractor.

2.7 PROTECTIVE CASING

A flush mount configuration must be fitted to each monitoring well with a minimum H-20 rated flush mount steel manhole (diameter as indicated in Paragraph 2.1.1 or 2.2.1) with a minimum 12-inch deep skirt.

Concrete pads must be installed around each flush mount installation. Concrete pads must be constructed of 3,000 PSI concrete, to the dimensions shown on the Contract Drawings. The annular space between the protective casing and the borehole below the concrete pad must be filled with ¾-inch stone.

PART 3 EXECUTION

3.1 PROTECTION OF EXISTING CONDITIONS AND UNDERGROUND UTILITIES

Maintain existing survey monuments, monitoring wells, and protect them from damage from equipment and vehicular traffic. Repair any items damaged by the Contractor. Prior to monitoring well construction activities, obtain utility clearance using the New Jersey One-Call System, to avoid disturbing buried utilities. Submit utility clearance records to the Contracting officer prior to drilling. Update utility clearance as necessary so that no drilling is performed after the utility clearance period has expired. In addition, consult with the property owner to locate any buried utilities, septic tank, or any other buried structures on their property.

3.2 GENERAL

All drill rig must be free from leaks of fuel, hydraulic fluid, and oil that may contaminate the borehole, ground surface or drill tools. During drilling, precautions must be used to prevent tampering with the borehole or entrance of foreign material. Runoff must be prevented from entering the borehole during construction. If there is an interruption in work, such as overnight shutdown or inclement weather, the borehole opening must be closed with a watertight uncontaminated cover. The cover must be secured in place or weighted down so that it cannot be removed except with the aid of the drilling equipment or through the use of drill tools.

3.3 PREPARATION

3.3.1 Surveying

Survey the horizontal location, ground surface elevation, and top of inner casing at each of the monitoring wells. Determine the elevation to nearest 0.01 foot and the horizontal location to the nearest 0.1 foot. The coordinate system must be the New Jersey State Plane Coordinate System and datum must be North American Datum 1983 (NAD83). The elevation datum must be North American Vertical Datum (NAVD88). Report coordinates and

elevations in feet.

3.3.2 Decontamination

During mobilization, construct a temporary decontamination pad at the site staging area where the drill rig, drill rods, drill bits, temporary casing, permanent casing, well developing equipment, tremie pipes, grout pumping lines, and other associated equipment must be cleaned with high-pressure hot water/steam prior to drilling at each well location. The pad must be of sufficient size so as to contain water generated during decontamination. Construct the pad with plastic sheeting, plywood sheeting, lumber, and hay-bales or other suitable materials. Maintain the decontamination pad for the duration of well installation activities. Submit the design of the decontamination pad for approval by the Contracting Officer.

Clean the equipment after the last borehole/well is drilled/installed. Conduct decontamination in accordance with [ASTM D5088](#) and the Contractor's approved Quality Assurance Project Plan (QAPP). Perform decontamination at a central decontamination station.

Use a sump pump for the removal of steam cleaning rinsate. Place the sump pump at the low end of the decontamination pad. Supply the sump pump and all necessary equipment (e.g., generator, hoses). Contain rinsate and spray from steam cleaning on the decontamination pad; therefore, erect plastic-covered walls on the sides of the decontamination pad, if necessary. When not in use, cover the decontamination pad with plastic to prevent rainwater from collecting on the pad. Collect and dispose of all decontamination wash water in accordance with [SECTION 02 81 00 - TRANSPORTATION AND DISPOSAL OF WASTE MATERIAL](#).

3.3.3 Containerization of Drill Cuttings

Furnish D.O.T. approved drums or vessels with lids, lid gaskets, bolts, chain of custody forms and drum labels. Mark each drum label in accordance with [49 CFR 172](#) in addition to the following information:

- a. Drum number
- b. Site name
- c. Well name and number
- d. Contents and date
- e. Approximate depth of material contained in each drum
- f. Name and phone number of the Contracting Officer

3.4 OVERBURDEN WELL INSTALLATION

3.4.1 Drilling Method

Advance/install all borings/wells with the rotary sonic drilling method performed in accordance with [ASTM D6914/D6914M-16](#). The use of other drilling methods must be subject to approval by the Contracting Officer. Drill rig(s) must be capable of advancing a nominal 6-inch borehole and installing single and double cased 2-inch monitoring wells in accordance with [ASTM D5092](#) to a depth of 50 feet. The depth to weathered bedrock

varies from 35 to 46 feet, and the drill rig must be capable of advancing the borehole at least 5 feet into weathered bedrock.

Portions of the borehole that advance through weathered bedrock must be backfilled with grout. The bentonite seal must extend to a point one foot below the selected depth of the screened zone. At least one foot of sand seal must be placed above the bentonite seal prior to casing and screen installation and filter pack placement.

The deep well screen must be installed just above weathered bedrock and the intermediate well screen must be installed within a zone with the highest concentrations of contaminants encountered during groundwater screening sampling, as approved by the Contracting Officer.

3.4.2 Casing and Screen Installation

The total depths and screened intervals of the wells are subject to change based on groundwater screening results.

Install casing and screens in the wells to the elevations shown on the Contract Drawings or as directed by the Contracting Officer.

Construct the wells by assembling individual sections of casing and screen at the well head and progressively lowering the assembly to the designated completion depth. Suspend the assembly 1 foot above the bottom of the borehole to allow the filter pack to form beneath the screen.

Connect all pipe sections by dry threading of the joints. Do not use glue, solvents, or lubricating compound to make up the connections. Make every effort to assure casing is plumb and centralized within the borehole. One centralizer must be placed just above the well screen.

3.4.3 Filter Pack Placement

Suspend the assembled casing and screen within the casing prior to the placement of filter pack material. After the screen and casing have been concentrically placed in the hole to the target depth, place the filter pack around the screen by filling the entire space between the screen and the wall of the borehole over the selected screened interval, and gradually pulling up the casing. The filter pack must extend from the total depth of the borehole to three feet above the top of the screen per the Contract Drawings. The filter pack must be placed via tremie pipe. Drill casing must be retracted gradually as the filter pack is emplaced in the borehole.

Directly measure and record the depth to the top of the filter pack periodically during placement. Obtain any water added to the filter pack material in accordance with Paragraph 2.6.

3.4.4 Sand Seal

Withdraw the casing and place the sand seal into the borehole annulus via 1-inch diameter tremie pipe so that the sand seal is 2 ft thick above the filter pack.

Measure the top of the sand seal before the placement of cement grout.

3.4.5 Cement/Bentonite Grout Placement

If the depth of the borehole allows, fill the remaining annular space with cement/bentonite grout to a depth up to two feet from the ground surface. Place the grout seal in a manner that completely fills the borehole annular space.

Place cement and bentonite grout using a tremie pipe. Lower the tremie pipe, which must have a rigid side discharge, to within 1 foot of the bottom of the interval to be grouted. The tremie pipe may be slowly raised during grouting but the discharge must remain submerged in undiluted grout. Grout must extend up to two feet below the ground surface.

Add additional grout from the surface to maintain the level of the grout as settlement occurs.

3.5 BEDROCK WELL INSTALLATION

3.5.1 Drilling Method

Advance/install 6-inch casing within a 10-inch borehole 5 feet into bedrock using rotary sonic method in accordance with [ASTM D6914/D6914M-16](#) or via air rotary drilling method performed in accordance with [ASTM D5782](#). Advance/install remaining bedrock borehole via air rotary drilling method performed in accordance with [ASTM D5782](#). The use of other drilling methods must be subject to approval by the Contracting Officer. Drill rig(s) must be capable of advancing a nominal 10-inch borehole to a depth of 70 feet, installing 6-inch steel surface casing to a depth of 5 feet into competent bedrock, and advancing a nominal 6-inch borehole to a depth of 150 feet.

3.5.2 Outer Casing Installation

Install a 6-inch steel surface casing to prevent contaminant migration into each bedrock borehole.

The total depth of the 6-inch steel surface casing will be dependent on the depth at which competent bedrock is encountered. Advance the nominal 10-inch borehole into competent bedrock as shown on the Contract Drawings. Grout the steel casing in place and allow the grout to set for minimum of 12 hours before drilling proceeds.

3.5.3 DNAPL FLUTE™ Liner Installation

Install FLUTE™ liners in the two newly installed deep bedrock boreholes to prevent cross contamination among fractures and to identify fractures where DNAPL may be located.

The DNAPL FLUTE™ system consists of an impermeable flexible liner with an external covering that reacts with pure product to form a bright dye stain. The system is emplaced by push-rod methods in which the liner is pressurized, forcing the reactive cover tightly against the borehole wall. The system is left in place for approximately one hour. Once the system is removed, the liner is examined for the presence and extent of DNAPL.

If significant evidence of DNAPL is observed on the FLUTE™ liners, emplace a blank/clean FLUTE™ liner in the open borehole to restrict DNAPL movement. Install FLUTE™ liners according to manufacturer's directions. If the FLUTE™ indicates the presence of significant DNAPL, it may be determined that the borehole should be abandoned. All such decisions must

be coordinated with the Contracting Officer.

Take care during downhole geophysical logging to prevent DNAPL migration within the borehole. If significant DNAPL is encountered in any borehole, it may be determined that the borehole is too contaminated for the geophysical tools. All such decisions will be coordinated with the Contracting Officer.

Pull the FLUTe™ liner to perform downhole geophysics in each borehole, as discussed in Paragraph 3.5.4, and then reinstall the liner following the completion of downhole geophysics prior to packer testing.

Pull the FLUTe™ liner to perform packer testing and sampling in each borehole, as discussed in Paragraph 3.5.5, and then reinstall the liner following the completion of packer testing prior to well installation.

3.5.4 Downhole Geophysics

Perform downhole geophysical logging to determine the presence and location of bedrock fractures that may facilitate the transport of contaminated groundwater, and to determine the depths at which packer testing will be performed.

Conduct all geophysical logging in accordance with [ASTM D5753-18](#).

Run a suite of downhole geophysical logs in the bedrock portion of open boreholes at each of the bedrock boreholes. The downhole geophysical logging suite must include the following sondes: acoustic televiewer, mechanical caliper, fluid temperature and resistivity, electrical resistivity, spontaneous potential (SP), and vertical heat-pulse flow.

Upon completion of this task, provide downhole geophysical logs to the Contracting Officer to select intervals for discrete-depth groundwater sampling for packer testing discussed in Paragraph 3.5.5.

3.5.5 Packer Testing

Up to five intervals per boring will be selected for discrete-depth, packer test groundwater sampling. Isolate each interval using an inflatable, dual-packer assembly.

Upon inflation of the packers, briefly develop the interval to clear the formation of silt and fine grained particles.

Monitor and record groundwater quality parameters including pH, conductivity, temperature, dissolved oxygen, oxidation-reduction potential, and turbidity. Upon stabilization of the parameters, collect groundwater samples and analyze in accordance with SECTION 01 35 45 - CHEMICAL DATA QUALITY CONTROL for 24-hour turn-around time volatile organic compound (VOC) analyses. Perform transmissivity testing for each interval in accordance with [ASTM D4630-19](#).

Upon completion of this task, provide VOC data and observations obtained from the bedrock boreholes including relative transmissivity of each zone to the Contracting Officer for government review to determine the intervals most likely to contain site-related contamination. This information will be used to select intervals for discrete-depth groundwater sampling. As directed by the Contracting Officer, advance two shallow bedrock boreholes to the target depth based on the interval

selected for shallow bedrock groundwater sampling.

3.5.6 Well Casing and Screen Installation

The total depths and screened intervals of the wells are subject to change based on groundwater screening results and other borehole testing. Solely for estimation of costs, assume that well screens for the shallow bedrock wells will be installed at 42-52 feet bgs and well screens for the deep bedrock wells will be installed at 85-95 feet bgs. The Contractor must install casing and screens in the wells to the total depths as directed by the Contracting Officer.

Place grout via tremie into the borehole annulus to seal the portions of the bedrock that are not targeted for installation of a monitoring well screen. Where a monitoring well is to be installed above a portion of the borehole that has been sealed with grout, install a sand seal a minimum of five feet between the screen zone and the top of the grouted borehole.

Construct the wells by assembling individual sections of casing and screen at the well head and progressively lowering the assembly to the designated completion depth. Suspend the assembly 1 foot above the bottom of the borehole to allow the filter pack to form beneath the screen.

Make every effort to assure casing is plumb and centralized within the borehole. One centralizer must be placed just above the well screen.

3.5.7 Filter Pack Placement

Suspend the assembled casing and screen within the casing prior to the placement of filter pack material. After the screen and casing have been concentrically placed in the hole to the target depth, place the filter pack around the screen by filling the entire space between the screen and the wall of the borehole over the selected screened interval, and gradually pulling up the casing. The filter pack must extend from the total depth of the borehole to three feet above the top of the screen per the Contract Drawings. The filter pack must be placed via tremie pipe. Drill casing must be retracted gradually as the filter pack is emplaced in the borehole.

Directly measure and record the depth to the top of the filter pack periodically during placement. Obtain any water added to the filter pack material in accordance with Paragraph 2.6.

3.5.8 Sand Seal

Withdraw the casing and place the sand seal into the borehole annulus via 1-inch diameter tremie pipe so that the sand seal is 2 ft thick above the filter pack.

Measure the top of the sand seal before the placement of cement grout.

3.5.9 Cement-Bentonite Grout Placement

If the depth of the borehole allows, fill the remaining annular space with cement/bentonite grout to a depth up to two feet from the ground surface. Place the grout seal in a manner that completely fills the borehole annular space.

Place cement and bentonite grout using a tremie pipe. Lower the tremie

pipe, which must have a rigid side discharge, to within 1 foot of the bottom of the interval to be grouted. The tremie pipe may be slowly raised during grouting but the discharge must remain submerged in undiluted grout. Grout must extend up to two feet below the ground surface.

Add additional grout from the surface to maintain the level of the grout as settlement occurs.

3.6 WELL COMPLETION OF NEW AND MODIFIED MONITORING WELLS

Each newly installed well must be furnished with a flush mount manhole as specified on the Contract Drawings and as indicated below.

- a. For overburden wells, flush mount protective casing must be 8-inch diameter.
- b. For bedrock wells, the casing must be 12-inch to facilitate possible installation of injection well head.

Flush mount casings must be raised slightly above surrounding ground surface to promote water runoff. All wells must be secured with identical padlocks and a master key provided by the Contractor.

Fit each new well with a permanent well ID tag riveted to the casing. The ID tag must include NJ well ID number, the well name, open interval and date completed. The Contracting Officer must supply well name for the well ID tag to the Contractor.

Each well must have a concrete pad constructed to the dimensions shown on the Contract Drawings. The pad must have a minimum of 6-inches of pad between the outer edge of the pad and the outer edge of the protective casing when it is centered in the pad. Each pad must be a minimum of 2-foot square, at least 8 inches in total thickness, and formed at the surface with 2-inch by 4-inch boards. The concrete pad must slope away from the outside of the casing to facilitate runoff away from the well. After the pad is cured, remove the form, and rake/fill the adjacent land surface so that the edge of the top of the pad is flush with the adjacent land surface. Concrete must be as specified in Paragraph 2.7.

3.7 WELL DEVELOPMENT

Within seven calendar days of completion of each new well, but no sooner than 48 hours after cement grouting is completed, the well must be developed in accordance with [ASTM D5521](#) and [ASTM D5092](#). The goal of well development is to ensure the hydraulic connection between the well and the surrounding formation. A development record must be maintained and submitted to the Contracting Officer.

Develop each well by mechanical surging and pumping methods as described below. Do not damage the well during well development. Provide a separate sampling port on the discharge line for water quality sample collection during the development process.

Proceed with well development until there is no improvement in specific capacity and the well acceptance criteria have been met as described in Paragraph 3.9. If the well has not been fully developed at the end of the initial 4-hour period, proceed with development for additional 1-hour increments until, in the opinion of the qualified geologist, the well is fully developed to its maximum specific capacity and all acceptance

criteria have been met. Do not proceed beyond the initial development period without the approval of the Contracting Officer.

3.7.1 Overburden Well Development

Provide a vented surge block and submersible pump. Development must proceed by alternating surging and pumping to facilitate two-way flow through the filter pack and to remove fine material from the well screen and filter pack. The pump must be capable of operating at rates between 0.5 and 5 gallons per minute (gpm) at anticipated heads ranging from 5 to 50 feet.

Develop wells by mechanical surging and pumping for a minimum of 1 hour. As a first step, pump the well at a rate of 0.5 gpm for 10 to 15 minutes to establish that formation water is entering the well. Record the depth at which drawdown stabilizes and use the depth to evaluate progress of well development.

Once it has been established that formation water is entering the well, begin well development by surging and pumping at low rate of pumping (0.5 to 2 gpm), such that the water level in the well does not draw down below the top of the well screen. Perform surging throughout the entire screen interval beginning at the top and moving to the bottom of the screen. Progressively increase the pumping rate to a maximum rate of 5 gpm as development proceeds.

At each 15-minute interval, measure and record specific capacity and sediment thickness to document progress of well development. If the sediment is greater than 1 foot, remove the sediment before proceeding with development activities.

3.7.2 Bedrock Well Development

Provide a vented surge block and submersible pump that allows simultaneous surging and pumping to be accomplished. The pump must be capable of operating at rates between 0.5 and 5 gallons per minute (gpm) at anticipated heads ranging from 10 to 100 feet.

Develop wells by mechanical surging and pumping for a minimum of 4 hours. As a first step, pump the well at a rate of 0.5 gpm for 10 to 15 minutes to establish that formation water is entering the well. Record the depth at which drawdown stabilizes and use the depth to evaluate progress of well development.

Once it has been established that formation water is entering the well, begin well development by surging and pumping at low rate of pumping (1 to 2 gpm), such that the water level in the well does not draw down more than 1/3 of the distance between the static water level and the top of the well screen. Perform surging throughout the entire screen interval beginning at the top and moving to the bottom of the screen. Progressively increase the pumping rate to a maximum rate of 5 gpm as development proceeds.

At each 30-minute interval, measure and record specific capacity and sediment thickness to document progress of well development. If the sediment is greater than 1 foot, remove the sediment before proceeding with development activities.

3.8 INVESTIGATION DERIVED WASTE HANDLING

During all site work including well drilling, well construction and installation, well development, and equipment decontamination, contain all IDW (e.g., water, cuttings, drilling water, and grout) and trash at each well location using appropriate equipment or containers to prevent discharge to the environment. Transport the solid IDW to the site staging area and transfer solid IDW to bulk containers.

Dispose of all IDW offsite in accordance with SECTION 02 81 00 - TRANSPORTATION AND DISPOSAL OF WASTE MATERIAL.

3.9 ACCEPTANCE CRITERIA

An acceptable groundwater monitoring well must be, in the opinion of the Government:

- a. Substantially sediment-free (i.e., with turbidity less than 50 NTU after pumping 3 well volumes).
- b. In conformance with AWWA and EPA Standards.
- c. Structurally sound.
- d. Responsive to water level changes in the aquifer.
- e. Yielding water at a rate appropriate for the aquifer.

Set all casing, screens, grout and gravel packs to depths as selected by the Government.

All wells must be constructed and casing installed plumb and true to line. Perform an initial test on monitoring wells by passing a slug, 1.8 inches in diameter and 10 feet long for the full length of the well. If, in the opinion of the Government, a well might be out of plumb alignment, further test the well in accordance with AWWA A100, Sections 1-6.2 and 1-6.3.

3.10 DRILLING WORK PLAN

The drilling work plan must include, at a minimum, the following information:

- a. Schedule for completing the work.
- b. Proposed drilling methods if not included in the Uniform Federal Policy Quality Assurance Project Plan (UFP-QAPP)
- c. Borehole testing methods, such as the DNAPL liner testing, downhole geophysical logging, and packer testing, if not included in the UFP-QAPP
- d. Well development methods if not included in the UFP-QAPP
- e. List of equipment to be used on the project
- f. Staging plan for drill spoils, which will be disposed of in accordance with SECTION 02 81 00 - TRANSPORTATION AND DISPOSAL OF WASTE MATERIAL.
- g. Proposed personnel to be assigned to the work (with a description of

professional experience) and license

- h. Onsite personnel Health and Safety documentation
- i. A list of products proposed for use, together with manufacturer's published description information on the item, for the following items:
 - (1) Surface casing: including copy of manufacturer's certification that material being supplied meets specified requirements
 - (2) Well casing; including copy of manufacturer's certification that material being supplied meets specified requirements
 - (3) Well screen; including copy of manufacturer's certification that material being supplied meets specified requirements
 - (4) Filter pack; including manufacturer's grain size analysis
 - (5) Sand seal; including manufacturer's grain size analysis
 - (6) Grout
 - (7) Bentonite pellets or chips
 - (8) Protective Casings and caps to be used

3.11 WELL CONDITION ASSESSMENT

Well condition as determined during a 2022 site visit is provided for each well in the performance monitoring well network in Table 33 51 39-1. Perform a well condition assessment for each well to determine whether any well requires repair, maintenance, extension, or abandonment.

For any monitoring well that can be repaired, perform all repair in accordance with Paragraph 3.4 or 3.5 depending on whether the monitoring well is an overburden or bedrock monitoring well. Perform monitoring well development in accordance with Paragraph 3.7. Determine whether the monitoring well repair and/or maintenance/development is satisfactory by evaluating the well with respect to the acceptance criteria as described in Paragraph 3.9.

Some monitoring wells are buried and require extension of the casing to ground surface. Perform casing extension in accordance with Paragraph 3.12.

If a monitoring well requires abandonment, perform monitoring well abandonment in accordance with Paragraph 3.13.

3.12 EXTENSION OF EXISTING WELLS

Some monitoring wells are currently buried at the site, as indicated on Table 33 51 39-1. For monitoring wells that are usable/do not require abandonment but whose casing is below ground surface, extend the existing well inner casing to allow for the inner casing to be 4 inches below surrounding ground surface. Additionally, install a new protective outer casing.

For each well identified for extension, measure the distance from the top of inner casing (TIC) measuring point to the total depth of the well before and after conversion, to provide a working estimate of the

elevation of the new TIC measuring point. Contact NJDEP so that the well permit for each converted well can be updated to reflect the new design and measuring point elevation.

Modify existing wells in a manner that ensures that the inner casing is not damaged. The inner casing must be extended using a PVC compression, screw, or slip coupling that creates a water tight seal between the existing and extended PVC well casing. Do not use any glue, solvents, or lubricating compounds to make up the connections. Place a minimum 6-inch diameter grout collar around the extended casing.

Install a permanent steel protective casing to be flush with the surrounding ground surface in accordance with Paragraph 3.6. The top of the steel protective casing shall extend 6 inches above the inner PVC casing. Fill the annulus around the outside of the protective casing with concrete, as specified in Paragraph 2.7. Perform well completion in accordance with Paragraph 3.6.

3.13 WELL ABANDONMENT (WELL DECOMMISSIONING)

Well abandonment must be performed by a NJ-licensed driller, in accordance with [N.J.A.C. 7:9D](#). The wells to be abandoned are to be determined by the Contractor. Well construction information is provided on Table 01 11 00-1. Obtain the permit number and monitoring well record for the monitoring wells slated for abandonment.

Perform well abandonment procedures as follows ([N.J.A.C. 7:9D](#)):

- a. Clear the well of pump, pipe, debris, and all other obstructions
- b. After removal of materials from the well, seal the well with grout, via tremie pipe, from the bottom of the well and extending upward to the desired depth. Prepare grout in accordance with the cement/bentonite grout specifications listed in Paragraph 2.4.
- c. Return to the well 24 to 72 hours after grouting to check for settlement and add grout if necessary.
- d. Cut the well casing off 2 feet below grade. Place a concrete cap above the well head, and restore the surface with like material to the surrounding area.
- e. If the well is over-drilled to remove the entire casing, screen, and gravel pack, the resulting borehole must be constructed to, and maintained at, the original depth of the well until this borehole is properly sealed with grout, via tremie pipe, from the bottom of the well to the desired depth. Prepare grout in accordance with the cement/bentonite grout specifications listed in Paragraph 2.4.
- f. Provide adequate protection for the top of the borehole and/or the top of the well casing to prevent surface contamination from entering the well during the sealing operation and when the driller is not at the sealing site.
- g. Place a minimum 6-inch thick concrete cap above the well head of each abandoned well, and restore the surface with like material to the surrounding area. Concrete must be in accordance with Paragraph 2.7.

If the well record cannot be found or certain other conditions exist, the

Contractor must submit a Well Decommissioning Plan to NJDEP. Submit a Well Decommissioning Plan in accordance with [N.J.A.C. 7:9D-3.1\(j\) \(k\)](#) if any of the following conditions apply. For wells requiring a decommissioning plan, do not decommission the well until NJDEP provides written approval of the Well Decommissioning Plan and an approval number.

- a. The well record cannot be obtained (except in the case of hand dug wells or wells that have a diameter of 2-inches or less).
- b. Wells that are affected by saltwater intrusion
- c. Wells which cannot be cleared of all obstructions throughout the entire length and diameter of the well
- d. Multiple cased wells
- e. Wells for which the well record does not match the measured depth, diameter and construction of the well

-- End of Section --

Table 33 51 39-1

Monitoring Well Construction and Groundwater Elevations
White Chemical Corporation Superfund Site, OU3

	Location	Well Construction Information						Well Field Condition on October 25, 2022	Comments
		Well Diameter/ Materials	Top of Inner Casing Elev. (ft amsl)	Easting (X)	Northing (Y)	Well Screen Interval (ft bgs)	Well Depth (ft bTIC)		
Bedrock	MW-1B1	2-inch SS	16.40	576399.103	678669.9205	73-83	86.21	Not located	Appears to be burried by new stone
	MW-1B2	2-inch SS	16.39	576399.103	678669.9205	95-100	104.5	Not located	Appears to be burried by new stone
	MW-3B1	4-inch SS	18.32	576571.2673	679048.604	52-62	63.76	Located	Beneath vehicles
	MW-6B1	2-inch SS	20.08	576265.4819	679151.7092	42-52	53.8	Located	
	MW-6B2	2- inch SS	20.08	576265.4819	679151.7092	85-95	96	Located	
	MW-6B3	2- inch SS	19.95	576278.7004	679172.777	114-124	121.05	Located	
	MW-6B4	2- inch SS	19.99	576278.7004	679172.777	155-165	168.5	Located	
	MW-16B1	2-inch PVC	18.10	576175.4691	679479.2831	43-53	53.15	Located	Within large puddle
Deep Overburden	MW-16B2	2-inch PVC	18.21	576175.4691	679479.2831	77-87	87.35	Located	Within large puddle
	MW-1D	2-inch SS	15.55	576424.781	678676.5222	40-45	48.32	Not located	Appears to be burried by new stone
	MW-2D	4-inch SS	18.26	576496.6264	678864.3806	33-43	45.28	Located	Beneath vehicles
	MW-3D	2-inch SS	18.39	576579.2285	679066.5576	36-41	44.28	Located	Beneath vehicles
	MW-5D	2-inch SS	17.14	576351.4749	679389.7668	24-29	31.14	Located	Appears to be burried by new stone
	MW-6D	4-inch SS	20.03	576262.479	679181.5929	24-34	35.8	Located	Potentially damaged
	MW-7D	2-inch SS	18.47	576349.4087	678941.6514	24-29	32.12	Located	Covered by loose crashed stone
	MW-14D	4-inch PVC	19.00	576044.2056	679257.0653	26-36	35.42	Located	Within large puddle
	MW-16D	4-inch SS	18.36	576169.01	679473.45	24-34	28.74	Not located	Likely within large puddle
	MW-22D	2-inch PVC	19.05	576344.1258	679188.9907	28.5-38.5	38.61	Not located	
	MW-23D	2-inch PVC	18.99	576369.5645	679167.6945	34-44	45.81	Not located	
	MW-24D	2-inch PVC	21.97	576288.3871	679077.5138	25.5-35.5	36.42	Located	No well cap and outer casing was filled with stone (likely MW-24D)
	MW-25D	2-inch PVC	21.37	576325.2359	679067.3191	34-44	46.2	Not located	
	MW-26D	2-inch PVC	19.86	576299.6843	678915.4236	24.5-34.5	35.78	Not located	
	MW-27D	2-inch PVC	19.75	576425.1951	679002.1369	34-44	43.7	Not located	
	MW-28D	2-inch PVC	20.54	576395.7008	679034.3224	34-44	45.4	Not located	
Intermediate Overburden	MW-23I	2-inch PVC	19.27	576363.5893	679158.2427	22-32	27.95	Not located	
	MW-25I	2-inch PVC	21.36	576319.9376	679056.3407	22-32	33	Not located	
	MW-26I	2-inch PVC	19.52	576307.71	678922.7321	15-25	25.36	Not located	
	MW-27I	2-inch PVC	19.81	576434.2889	679017.8575	17.2-27.2	27.8	Not located	
	MW-28I	2-inch PVC	20.43	576387.0546	679024.3626	16.7-26.7	28.4	Not located	
	MW-1S	2-inch SS	17.08	576419.5529	678660.8667	7-17	20.09	Not located	Appears to be burried by new stone
Shallow Overburden	MW-2	2-inch SS	18.37	576512.4184	678842.5108	7-17	19.25	Located	Beneath vehicles
	MW-3S	2-inch SS	18.22	576590.2903	679062.0238	7-17	20.52	Located	Beneath vehicles
	MW-4	2-inch SS	19.22	576423.7993	679232.1869	8-18	21.2	Located	Beneath tank
	MW-5S	2-inch SS	17.28	576340.7272	679394.2272	7-17	17.9	Located	Appears to be burried by new stone
	MW-6	2-inch PVC	19.57	576257.7162	679167.8976	7-17	17.3	Located	
	MW-7S	2-inch SS	19.03	576341.0676	678947.8665	7-17	18.97	Located	
	MW-14S	4-inch PVC	18.95	576042.7754	679261.6208	10-20	18.72	Located	
	MW-22S	2-inch PVC	19.36	576336.2589	679178.0484	17-27	27.51	Not located	
	MW-24S	2-inch PVC	21.67	576284.1925	679066.3724	15-25	26.74	Not located	No well cap and outer casing was filled with stone (likely MW-24D)

Notes:

ft amsl - feet above mean sea level

ft bgs - feet below ground surface

ft bTIC - feet below top of inner casing

PVC - polyvinyl chloride

SS - stainless steel

Ground finishing for each well to be determined during well condition assessment